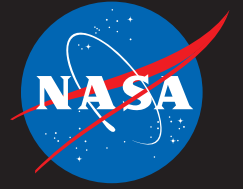


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National Aeronautics and Space Administration



Cultural Resources Management Plan for Santa Susana Field Laboratory Ventura County, California, January 2009–2013



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**Cultural Resources Management Plan
for Santa Susana Field Laboratory
Ventura County, California, January 2009–2013**

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Executive Summary

This Cultural Resources Management Plan (CRMP) for Santa Susana Field Laboratory (SSFL) is the National Aeronautics and Space Administration's (NASA's) mechanism for complying with historic preservation requirements set forth in Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966, as amended through 2006. Many laws, regulations, and policies guide NASA in its management of cultural resources. As noted above, compliance with the National Environmental Policy Act (NEPA) is central to any actions affecting cultural resources and requires compliance with NHPA; PL89-655, as amended through 2006, 16 USC 470 *et seq.* NEPA, among its other goals, says that the Federal Government shall "preserve important historic, cultural, and natural aspects of our national heritage..." (NEPA Section 101(b)(4)). NHPA requires that NASA consider the effect of its actions on cultural resources that are eligible for inclusion in the National Register of Historic Places (NRHP).

This CRMP, modeled after the CRMP for Marshall Space Flight Center (MSFC), focuses on specific actions SSFL must take to gain and maintain compliance status with applicable cultural resources protection laws and regulations. This document outlines specific actions that must be taken to integrate the disposition of SSFL with NASA's cultural resources program to minimize potential effects to historic properties.

Archeological and historical surveys have been completed for SSFL. These investigations recorded and evaluated cultural resources within SSFL for eligibility to the NRHP. Cultural resources at SSFL include NRHP-listed and potentially eligible archeological sites, buildings, structures, and objects.

The SSFL has developed this CRMP as its internal compliance and management tool. This document supports SSFL activities and meets the legal compliance requirements of Federal historic preservation laws and regulations in a manner consistent with the sound principles of cultural resources stewardship. This CRMP establishes priorities and standards for the identification, evaluation, preservation, and mitigation of cultural resources properties at SSFL.

Implementation of this CRMP will help ensure that all applicable laws, regulations, Presidential Memoranda and Executive Orders (EOs), and other directives are considered in properly implementing SSFL's cultural resource management responsibilities. The SSFL CRMP includes a series of policies and standard operating procedures that will ensure compliance with Federal laws and implementing regulations. This document also identifies various public and tribal consultation requirements and how to incorporate them into SSFL activities, and provides management goals regarding cultural resource responsibilities.

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1. Introduction

The National Aeronautics and Space Administration's (NASA's) Marshall Space Flight Center (MSFC) developed this Cultural Resources Management Plan (CRMP) to provide decision makers with the necessary information to make appropriate choices for the management of the significant cultural resources at federally-owned and MSFC-managed areas of Santa Susana Field Laboratory (SSFL) in Ventura County, California.

Specific objectives of the SSFL CRMP include the following:

- Integrating historic preservation requirements with NASA decisions that may affect historic properties within the SSFL, including facility demolition and other real property or land use decisions.
- Establishing a legally approved compliance procedure with the Advisory Council on Historic Preservation (ACHP) and the California State Historic Preservation Officer (CA SHPO).
- Providing a comprehensive inventory of archeological and historical resources within the federally-owned property on SSFL.
- Providing for the protection and treatment of archaeological resources, including the following:
 - Establishing guidelines for visitors to the sites.
 - Establishing requirements for unanticipated discovery of archeological resources.
 - Establishing guidelines for security of the sites.

This CRMP is designed to assist SSFL in identifying procedures required to comply with appropriate Federal laws and implementing regulations. Among these laws are the National Environmental Policy Act (NEPA) of 1969, the National Historic Preservation Act (NHPA) (as amended through 2006) of 1966, and the Archeological Resources Protection Act (ARPA) of 1979. While these laws are separate and distinct legal mandates, they each have procedural and penalty elements that can be used to halt or delay projects.

1.1 Plan Organization

The organization of the SSFL CRMP follows the structure of MSFC's current CRMP. The Introduction (Part 1) includes important information regarding NASA policies, goals of the plan, and information on how to use the plan.

Preservation Laws and Regulations (Part 2) includes brief summaries of relevant laws, implementing regulations, executive orders (EOs), and memoranda

regarding cultural resources preservation.

The Planning Level Survey (Part 3) summarizes the facility's history and defines its current activities. It also identifies the range of undertakings at SSFL that can affect cultural resources. Current procedures for managing cultural resources are also reviewed in Part 3. The overview then provides brief narratives of current knowledge about the natural environment, the prehistory, and the history of SSFL and the surrounding communities for context reference.

The Cultural Resources Inventory (Part 4) presents a summary of currently known cultural resources on federally-owned portions of SSFL. In this section, cultural resources are organized by type (e.g., archeological sites, historic, architectural, and other resources). This section includes criteria for establishing significance by which archeological sites and historic buildings may be evaluated for the National Register of Historic Places (NRHP).

The Management Plan (Part 5) defines cultural resource management (CRM) responsibilities of the SSFL Manager and the Natural and Cultural Resources Manager and provides a set of Standard Operating Procedures (SOPs). The SOPs are designed to address routine matters of cultural resources compliance and are accompanied by schematic flowcharts. A 5-year management plan identifies key objectives and specifies the resources and schedule needed to accomplish these objectives.

Finally, there are four appendices of relevant information that consist of an SSFL CRMP Acronym List (Reference A), an SSFL CRMP Glossary (Reference B), SSFL Historic Architectural Resources (Reference C), and Curation of Federally Owned and Administered Archeological Collections (Reference D).

1.2 Updating the Cultural Resources Management Plan

This CRMP is designed to be a "living" document of contemporary and practical use to SSFL planners. As land use of SSFL changes, so will the range and frequency of undertakings. Similarly, as the objectives of this 5-year plan are accomplished, new information about SSFL's cultural resources will be obtained. The three-ring binder format of this document allows for replacement of sections as may be warranted. The entire CRMP should be reviewed at the end of a 5-year cycle to determine if revisions or corrections are needed.

2. Preservation Laws and Regulations

2.1 Introduction

Cultural resources at NASA Headquarters and Centers (including Component Facilities) are regulated under the NEPA, which is implemented through NASA Policy Directives (NPDs) and NASA Procedural Requirements (NPRs). Among its other goals NEPA says that the Federal Government shall “preserve important historic, cultural, and natural aspects of our national heritage...” (NEPA Section 101(b)(4)). Compliance with NEPA is central to any actions at SSFL affecting cultural resources. NPRs for implementing NEPA (NPR 8580.1; see below) reference relevant laws, regulations, and Executive Orders (EOs); among them is the NHPA. The following discussion provides an overview of Federal statutes and regulations that are applicable to the management of cultural resources at SSFL.

2.2 Federal Laws and Regulations

2.2.1 National Environmental Policy Act of 1969

The National Environmental Policy Act, as amended (NEPA; Public Law (PL) 91-190, 42 United States Code (USC) 4371 *et seq.*), requires Federal agencies to consider the environmental effects of their proposed programs, projects, and actions prior to initiation. Pursuant to the NEPA and the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations (CFR) Parts 1500–1508), the proponents of NASA actions will ensure that cultural resources are fully considered when preparing NEPA documents.

NEPA documents will include a comprehensive assessment of the impacts of proposed NASA actions or activities on cultural resources. However, compliance with NEPA for a specific action does not relieve NASA of the independent compliance procedures associated with applicable cultural resources requirements. Information and findings obtained through compliance with cultural resources statutes, regulations, EOs, and Presidential Memoranda should be integrated into the concurrent NEPA compliance process and documents.

Impact assessments under NEPA must consider the effects of proposed Federal actions on cultural resources and the effects on Native American tribes, Native Hawaiian Organizations, Native Alaskans, and other ethnic and social communities to whom the cultural resources may have importance. The information needed to make such impact assessments may be acquired from information developed as a result

of compliance with cultural resources statutes, regulations, and EOs. Impact evaluation procedures as specified by Section 106 of the NHPA are currently the most acceptable process for dealing with cultural resources in a NEPA study. These procedures are discussed below.

2.2.2 National Historic Preservation Act of 1966

The NHPA (Public law (PL) 89-655, as amended through 2006, 16 USC 470 *et seq.*) establishes the Federal Government’s policy to provide leadership in the preservation of historic properties and to administer federally owned or controlled historic properties in a spirit of stewardship. Under Section 106 of NHPA, the NASA Center Director shall manage and treat historic properties affected by undertakings. Under Section 110, the Center Director shall also identify, evaluate, and nominate historic properties throughout the NASA Center for listing in the NRHP.

Section 101 of NHPA prescribes how state, local, and Indian tribal governments participate in the national historic preservation program, establishes how the NRHP is maintained and expanded, and directs the Department of the Interior to promulgate various standards and guidelines, including regulations requiring Federal agencies to place recovered artifacts and any records in institutions that have adequate long-term curatorial capabilities.

Section 106 of the NHPA requires Federal agencies to take into account the effects of their activities and programs on historic properties. The regulation with the most effect on SSFL’s planning is 36 CFR Part 800, Protection of Historic Properties, which implements Section 106. This regulation requires compliance through a process of identification; consultation with the CA SHPO, relevant Tribal Historic Preservation Offices (THPOs) and other concerned parties; and execution and implementation of agreements about how adverse effects will be addressed. It must be followed in planning any activity and in the ongoing management of installations. The Federal agency should consult the State Historic Preservation Office (SHPO), the THPOs, and, if necessary, the ACHP before beginning any undertaking that might affect historic properties. All consulted parties must be afforded a reasonable opportunity to comment.

Section 110 requires Federal agencies to designate qualified Federal preservation officers, to locate and inventory historic properties, to give preference to the

use of historic properties for mission purposes, and to establish and implement a historic preservation program that includes identification of historic properties, planned management of such properties, and specific procedures for compliance with Section 106.

Section 111 requires Federal agencies to “establish and implement alternatives for historic properties, including adaptive use” before leasing or exchanging historic property. The intent of this section is to “insure the preservation of the historic property.”

Section 112 requires a Federal agency’s employees or contractors to meet professional qualification standards published by the Secretary of the Interior.

Section 304 allows Federal agencies, in consultation with the Secretary of the Interior, to withhold from disclosure to the public information relating to the location or character of historic resources when it is determined that such information would result in a significant violation of privacy, endanger the ability of a Native American group to exercise its religion, or create a substantial risk of harm, theft, or destruction. This section most frequently applies to archeological sites and places of traditional religious value to Native Americans; however, locations are not universally withheld, and the need to withhold them must be balanced against the need of regulatory agencies and the public to know such locations to participate in project review under Section 106, NEPA, and other authorities.

2.2.3 Antiquities Act of 1906

The Antiquities Act of 1906 (PL 59-209; 16 USC 431, 432, and 433) allows the President of the United States (U.S.) to set aside Federal lands as historic landmarks. It also allows the Federal Government to acquire private land for historic preservation. The Act requires that qualified individuals conduct excavation of archeological sites on Federal land under federally issued permits and requires permanent preservation of artifacts and objects recovered from these excavations in museums.

The Act establishes penalties for any person who excavates, injures, or destroys any historic property in Federal land without permission from the appropriate Federal agency. Instructions for seizure of illegally acquired archeological objects are provided in implementing regulation 43 CFR Part 3. The procedure for issuing Federal permits has largely been given over the permits issued under ARPA (see below).

2.2.4 Archeological and Historic Preservation Act of 1974

The Archeological and Historic Preservation Act (AHPA) (also known as the Moss-Bennett Act, or the Archeological Data Preservation Act (ADPA)) (PL 85-532, 16 USC 469-469c) was passed as a revision and amendment to the Reservoir Salvage Act of 1960. The AHPA specifically provides for the survey and recovery of scientifically significant data that may be irreparably lost as a result of any alteration of the terrain from any Federal construction projects or federally licensed project, activity, or program.

When a Federal agency finds (or is notified in writing by an appropriate authority) that its activities may cause irreparable loss or destruction of significant scientific, archeological, or historical resources, the agency is required to notify the Secretary of the Interior in writing and is to provide information concerning the activity, in accordance with the AHPA. Upon this notification, the Secretary of the Interior shall, if he determines that such data are significant, and after reasonable notice to the installation responsible for the activity, conduct or cause to be conducted a survey and other investigation of the affected area and recover and preserve such data. The AHPA provides Federal agencies the authority to assist the Secretary of the Interior with funds for surveys or other activities to recover significant scientific data, but such financial assistance is not required. Likewise, Federal agencies may choose to undertake such professional survey and recovery activities themselves with funds appropriated for the project, program, or activity.

2.2.5 Archeological Resources Protection Act of 1979

Like the 1906 Antiquities Act, ARPA (PL 96-95, 16 USC 470aa-470mm) prohibits the excavation, collection, removal, and disturbance of archeological resources (as defined by ARPA) and objects of antiquity (as referenced in the Antiquities Act) on federally owned property without a permit issued by the appropriate Federal agency. Those permitted must be qualified individuals, and proposed recovery of archeological resources must be undertaken strictly for the purpose of furthering archeological knowledge. Permits must also require that the excavated archeological artifact collection and associated records are permanently curated in a facility that meets the requirements of 36 CFR Part 79. Permits are not necessary for archeological work conducted in support of mission requirements (e.g., in compliance with NHPA Section 106). Violation of ARPA may result in the assessment

of civil or criminal penalties and forfeiture of vehicles and equipment that were used in connection with the violation.

Federal agencies may withhold any information pertaining to the location of archeological sites if the agency determines that disclosing such information would put the resource at risk. ARPA specifically excludes such information against a Freedom of Information Act (FOIA) filing that includes all archeological resources, not just those that are NRHP listed or eligible. Federal agencies must develop plans for surveying lands not scheduled for specific undertakings, record and report archeological violations, and develop public awareness programs.

As indicated above, ARPA regulations (43 CFR Part 7) for the ultimate disposition of materials recovered as a result of permitted activities state that archeological resources excavated on public lands remain the property of the United States (U.S.). However, under the Native American Graves Protection and Repatriation Act (NAGPRA) (see below), materials may be the property of a culturally affiliated tribe and those materials excavated from Indian lands remain the property of the Indian or Indian tribe having rights of ownership of such resources.

2.2.6 Native American Graves Protection and Repatriation Act of 1990

NAGPRA (PL 101-601, 25 USC 3001-3013) sets forth rules for intentional excavation and removal of Native American cultural items including human remains, sacred objects, or items of cultural patrimony, and for inadvertent discovery of such items. The intent of NAGPRA is to identify proper ownership and to ensure the rightful disposition of human remains and specific cultural items (defined in Section 2 of NAGPRA) that are in Federal possession or control.

The act requires Federal agencies to inventory collections of human remains and funerary objects and to provide the culturally affiliated tribes with a collection inventory, requires repatriation on request to the culturally affiliated tribe, and makes illegal the sale or purchase of Native American human remains found on Federal or Native American lands. Under NAGPRA, Section 3(d), an agency must wait a mandatory 30 days before resuming a project even if the items found are minor or insignificant.

2.2.7 American Indian Religious Freedom Act of 1978

Under the American Indian Religious Freedom Act (AIRFA) (PL 95-341, amended 1994 as PL 103-344; 42 USC 1996 et seq.), NASA Center directors will develop and implement procedures to protect and preserve the American Indian, Eskimo, Aleut, and Native Hawaiian right of freedom to believe, express, and exercise their traditional religions, including, but not limited to, access to sacred sites, use and possession of sacred objects, and freedom to worship through ceremonials and traditional rites. Federal agencies shall also establish procedures to facilitate consultation with federally recognized Indian tribes and Native Hawaiian organizations, as appropriate. No sacred sites or sacred objects have been identified at the SSFL.

2.2.8 Curation of Federally Owned and Administered Archeological Collections (36 CFR Part 79)

The effective and efficient care of archeological collections generated by public projects is a responsibility of many Federal and other public agencies. These regulations, found in 36 CFR Part 79, establish the definitions, standards, procedures, and guidelines to follow in preserving collections of prehistoric and historic remains.

The Federal agency will ensure that all “collections,” as defined in 36 CFR Section 79.4(a), are processed, maintained, and curated in accordance with the requirements of 36 CFR Part 79. However, as noted above, NAGPRA cultural items and human remains in the possession and control of a Federal agency shall be disposed of in a manner consistent with the requirements of NAGPRA and 43 CFR Part 10.

NASA archeological collections may be processed, maintained, and curated on and by NASA; by another Federal agency, state agency, or other outside institution or nongovernmental organization, in cooperative repositories maintained by or on behalf of multiple agencies; or in other facilities, under contract, cooperative agreement, or other formal funding and administrative arrangement provided that the standards of 36 CFR Part 79 are met. Generally, NASA Center directors should not establish archeological curation facilities at individual centers due to the permanent recurring costs and personnel requirements to maintain such repositories to the minimum standards in 36 CFR Part 79 in perpetuity. Prior to NASA's approval of the establishment of an on-post

archeological curation facility, a cost analysis shall be conducted and included as a primary factor in the decision. The cost analysis will include factors such as: professional curatorial personnel costs for the installation, initial installation infrastructure start-up costs to establish the facility, and installation costs for annual operation, materials, maintenance, and repair. These installation cost factors should be compared with similar costs associated with curating the materials in an outside facility such as at a state museum, other Federal or state agency, or with a nongovernmental organization.

NASA Center directors shall establish procedures to minimize the amount of archeological "material remains" (as defined in 36 CFR Section 79.4(a)(1)) that are collected during archeological inventory and site excavation and that are permanently curated. Such procedures will be integrated into any SOPs and contracts or cooperative agreements for such activities and will serve to reduce the long-term costs associated with archeological materials curation requirements. Such procedures shall recognize that all archeological material remains recovered from fieldwork need not be accessioned into the Center collection and permanently curated. Archeological material remains recovered during field inventory and site identification efforts should be analyzed and recorded but should be evaluated prior to accessioning into the permanent Center archeological collection. For artifacts recovered from more extensive excavations (e.g., site evaluation for NRHP eligibility and data recovery excavations/mitigation) some classes of material remains may be analyzed and recorded, but not permanently accessioned into the Center collection. Permanent curation should be reserved for diagnostic artifacts and other significant and environmentally sensitive material that will add important information to site interpretation. Evaluation of materials for curation should be carried out in consultation with the SHPO.

2.3 Executive Orders and Presidential Memoranda

2.3.1 Executive Order 11593

EO 11593 *Protection and Enhancement of the Cultural Environment*, dated May 13, 1971, establishes a national policy to preserve and maintain the historic and cultural environment of the U.S. The EO directs Federal agencies to administer historic properties under their control so as to preserve the resources for future generations. This EO was essentially

incorporated into the 1980 amendments to the NHPA as Section 110 and was further revised during the 1992 amendment to the NHPA. Federal agencies must locate, inventory, and nominate all potentially eligible sites, buildings, districts, and objects under their control to the Secretary of the Interior for listing on the NRHP. The Federal agencies must also take precautions to prevent the sale, transfer, or demolition of historic properties. Any property that will be damaged as a result of a Federal undertaking must be fully assessed and documented before it is impacted. The agencies must report their efforts to the Secretary of the Interior.

2.3.2 Executive Order 13007

EO 13007 *Indian Sacred Sites*, dated May 24, 1996, requires Federal agencies to allow access to and ceremonial use of sacred Indian sites by Indian religious practitioners of federally recognized tribes. Agencies shall maintain confidentiality regarding the location of such sacred sites and shall avoid adversely affecting their integrity.

2.3.3 Executive Order 13287

EO 13287 *Preserve America*, dated March 3, 2003, establishes a national policy for Federal Government leadership in preserving America's heritage through active advancement of the protection, enhancement, and contemporary use of the historic properties owned by the Federal Government. This order also promotes intergovernmental cooperation and partnerships for the preservation and use of historic properties. Through specific steps and deadlines, the EO reemphasizes current requirements for assessment of the status of agency-controlled historic properties (under Section 110 of the NHPA) and management needs and suitability of these historic properties for contributing to community economic development initiatives, including heritage tourism.

2.3.4 Presidential Memorandum, Government-to-Government Relations With Native American Tribal Governments

Presidential Memorandum (PM) Government-to-Government Relations with Native American Tribal Governments, dated April 29, 1994, requires that the consultation occur between a Federal agency and federally recognized Indian tribes on a government-to-government basis and in an open and candid manner.

Consultation with federally recognized Indian tribes on a government-to-government basis occurs formally

and directly between NASA Center directors and heads of federally recognized tribal governments. Center directors establish government-to-government relations with federally recognized Indian tribes by means of formal, written letters to the heads of tribal governments. Such letters should designate a NASA Center Coordinator for Native American Affairs who is authorized to conduct follow-on consultations with designated representatives of the tribal government. Any final decisions on installation plans, projects, programs, or activities that have been the subject of government-to-government consultation will be formally transmitted from the NASA Center Director to the head of the tribal government.

This PM also requires that the NASA Center directors assess the impact of their plans, projects, programs, and activities on tribal trust resources and ensure that tribal government rights and concerns are considered during the development of such plans, projects, programs, and activities.

2.4 NASA Procedural Requirements 4310.1: Identification and Disposition of NASA Artifacts

Under NPR 4310.1, the National Air and Space Museum (NASM), which is administered by the Smithsonian Institution, is responsible for the custody, protection, preservation, exhibition, and loan of artifacts received from Government agencies. Repositories for NASA artifacts are identified with the assistance of the NASM so as to most effectively inform the public regarding NASA's endeavors. Artifacts are offered to the NASM when programmatic utility to NASA has been exhausted.

2.5 NASA Procedural Requirements 8580.1: Implementing the National Environmental Policy Act and Executive Order 12114

The preface of NPR 8580.11 (effective November 26, 2001, expiration November 26, 2008) states:

“In support and promotion of NASA's Strategic Plan, NASA's Strategy for Environmental excellence in the Twenty-First Century, and NASA Policy Directive (NPD) 8500.1, NASA Environmental Management, and consistent with the requirements of the (NEPA)..., The Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and NASA's

regulations (14 CFR Part 1216 Subpart 1216.3), this NASA Procedures and Guidelines (NPR) establishes standard procedures for implementing NEPA and NASA's overall environmental planning process.”

The Preface further states:

“This NPR establishes responsibilities, procedures, and guidelines for carrying out the requirements of NEPA, its implementing regulations, and EO 12114, Environmental Effects Abroad of Major Federal Actions. The requirements of NEPA, its implementing regulations, and, if applicable, EO 12114 must be satisfied before an action can be taken that would (a) have an adverse environmental impact or (b) limit the choice of reasonable alternatives.”

2.6 NASA Policy Directive 8500.1A: NASA Environmental Management

NPD 8500.1A (effective April 6, 2000, expiration April 6, 2009) states that “NASA's Environmental Management Division is responsible for enabling the success of Agency missions, services, and activities, as defined in the NASA Strategic Plan, while maintaining environmental stewardship of assets, controls over environmental responsibilities, and compliance with applicable law.”

This NPD also cites the NASA Administrator's May 1994 issuance of “Environmental Excellence for the Twenty-First Century,” defining “NASA's environmental strategy and setting forth a framework for meeting today's environmental needs and preparing for future challenges.”

2.7 Programmatic Agreement Among NASA, the National Conference of State Historic Preservation Officers, and the Advisory Council on Historic Preservation

In 1989, a Programmatic Agreement (PA) was signed between NASA, the National Conference of State Historic Preservation Officers (NCSHPOs), and the ACHP regarding the management of NASA's National Historic Landmarks (NHLs). The Agreement stipulates that NASA will consult with and obtain approval from the SHPO prior to dismantling or significantly affecting designated NHLs.

3. Planning Level Survey

This section presents an overview of SSFL and is structured in four primary discussions. We begin with a description of the physical environment, followed by a cultural overview, and a brief historical narrative of the installation. This section concludes with statements of SSFL's activities and organizational structure.

3.1 Location, Authority, and Physical Environment

The SSFL occupies 2,850 acres (1,153 hectares) and is located approximately 29 miles northwest of Los Angeles, CA, in the Santa Susana Mountain Range. The site sits near the crest of the Simi Hills between the Simi and San Fernando Valleys in southeastern Ventura County, as shown in Figure 3-1. The property is bounded by Canoga Park, in Los Angeles County on the east, Bell Canyon on the south, the Brandels-Barden Institute on the north, and Meier and Runkle Canyons to the northwest.

The site is divided into four areas (Areas I to IV) and a buffer zone. Areas I, III, IV, and the buffer zone are owned by Boeing. NASA owns 408 acres (165 hectares) designated as Area II and a 42-acre (17-hectare) portion of Area I. This Integrated Cultural Resources Management Plan defines the project area as Federally-owned areas of the SSFL. Vegetation

includes coastal sage scrub, chaparral, annual grasses, coast live oak, and abundant poison oak. The banks of ephemeral streams are also lined with sycamores. Native animals include mule deer, bobcats, mountain lions, coyotes, gray foxes, and ring-tailed cats.

3.1.1 Topography

The hilly terrain of SSFL located near the crest of the Simi Hills between the Simi and San Fernando Valleys, has approximately 700 ft (213 m) of topographic relief. The Simi Hills are part of the Santa Monica Mountains, which run east-west across southern California and form part of the California Coast Range of the Pacific Mountain System physiographic region. The elevation ranges from 1,650–2,175 ft (503–663 m) above mean sea level (msl) in the project area and consists of diverse terrain of ridges, canyons, and sandstone rock outcrops (NASA 2007).

3.1.2 Geology and Soils

The SSFL is part of the Chatsworth Formation, which is composed of poorly to well-cemented massive sandstone bedrock to clay, shale, and crushed sandstone, with interbeds of siltstone and claystone. The mountains consist mainly of late-middle to early Tertiary sedimentary rocks (8–70 million years old). It is situated on rocky terrain and occupies an upland

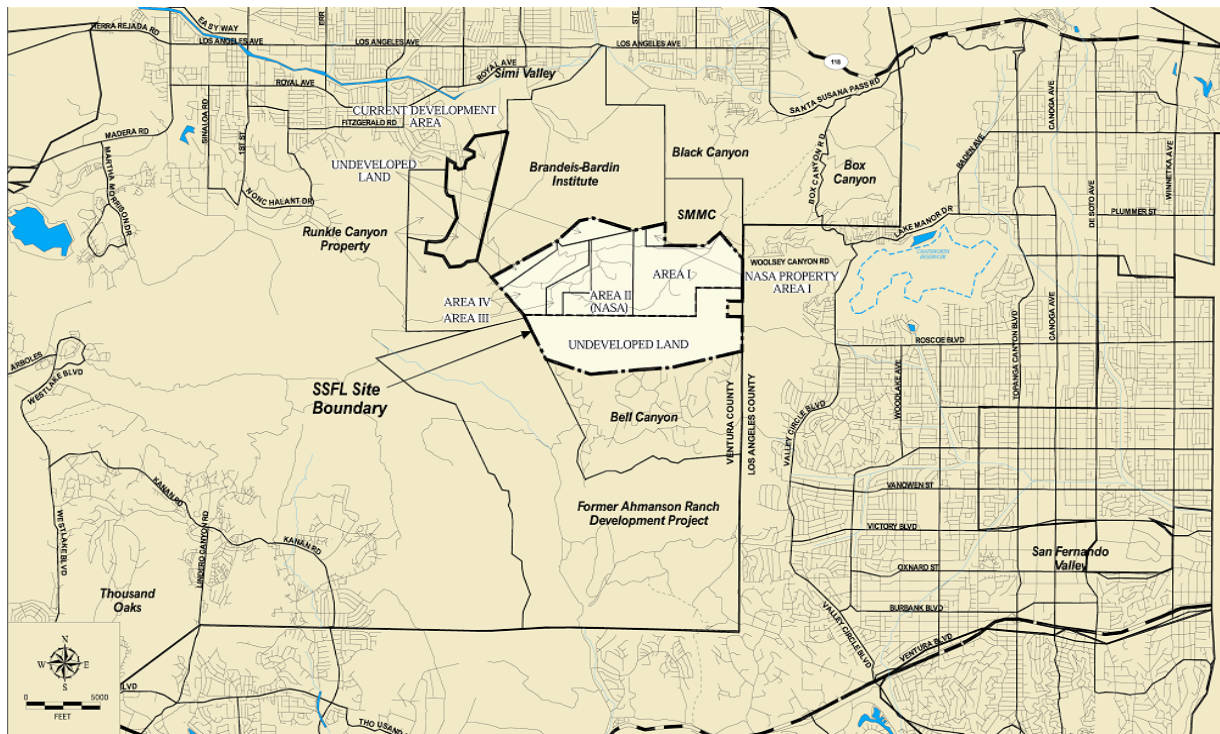


Figure 3-1. Santa Susana Field Laboratory Regional Map.

area known as Burro Flats, which sits at the crest of the Simi Hills, near their eastern end (Department of Energy (DOE) 2003). Overlying soils consist of weathered bedrock and alluvium (unconsolidated sand, silt, and clay materials that have been eroded primarily from the surrounding Chatsworth and Martinez Formations). Several geologic faults traverse the site (Marshall Space Flight Center (MSFC) 2007a).

3.1.3 Vegetation and Land Cover

Ecological resources, including terrestrial, aquatic, and wetland features of SSFL are described in this section. These resource descriptions include lists of species compiled from regional studies conducted by state and Federal agencies.

The undeveloped areas within the SSFL site, both in open space and in the natural areas surrounding the developed site areas, consist of a large area of diverse habitats, primarily characterized as chaparral/oak woodland. This diversity is reflected in a wide variety of plants and animals at the site. The habitat and species diversity associated with the SSFL property, the physical attributes of the facility, and its geographic location make the area a potentially important route for effective movement of species. The open space at the site may play an important role as a habitat linkage between the Santa Susana Mountains, the Simi Hills, and possibly the Santa Monica Mountains (MSFC 2007a).

Sixteen different vegetation habitat types are found at the SSFL including freshwater marsh, open water, unvegetated drainage channels, coast live oak woodland, southern coast live oak riparian forest, southern willow scrub, mulefat scrub, baccharis scrub, Venturan coastal sage scrub, chaparral, native grassland, non-native grassland, ruderal, rock outcrop, eucalyptus woodland, and developed. Rock outcrops occur throughout SSFL and may be found in any of the vegetation types. The banks of the ephemeral streams are also lined with sycamore trees (NASA 2007a).

Four sensitive plant species have been documented on SSFL. Braunton's milk vetch (*Astragalus brauntonii*) is a federally endangered plant that is present in the far western portions of SSFL. Santa Susana tarplant (*Hemizonia minthornii*) is a California state rare plant that can be found on rocky outcrops throughout the facility. California black walnut and Mariposa lily have also been documented at SSFL (MSFC 2007a).

3.1.4 Wildlife and Aquatic Resources

This section describes the wildlife and aquatic resources potentially occurring on SSFL.

Wildlife surveys performed at SSFL and published in the *Resource Conservation and Recovery Act (RCRA) Facility Investigation Program Report, Surficial Media Operable Unit*, SSFL, July 2004 (MWH, 2004) provide a basis for wildlife descriptions for SSFL. The wildlife surveys identified 13 mammal species including, bobcat (*Lynx rufus*) and mule deer (*Odocoileus hemionus*). Sixty-nine bird species have been identified at SSFL. The most frequently observed birds are scrub jay (*Aphelocoma californica*), yellow rumped warbler (*Dendroica coronata*), turkey vulture (*Cathartes aura*), red-shouldered hawk (*Buteo lineatus*), northern flicker (*Colaptes auratus*), California quail (*Callipepla californica*), red-winged blackbird (*Agelaius phoeniceus*), and great blue heron (*Ardea herodias*). Raptors found on SSFL include the sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), red-tailed hawk (*Buteo jamaicensis*), and great horned owl (*Bubo virginianus*). Ten reptile species and three amphibian species have been observed on SSFL. Western whiptail (*Aspidoscelis tigris*), side-blotched lizard (*Uta stansburiana*), California slender salamander (*Batrachoseps attenuatus*), Pacific tree frog (*Hyla regilla*), and California toad (*Bufo boreas halophilus*) are among the reptiles and amphibians found on SSFL (MSFC 2007a).

Two fish species have been noted on SSFL including catfish and goldfish (MWH, 2004).

No federally listed wildlife species occur on SSFL. California state wildlife species of concern found on SSFL include San Diego black-tailed jackrabbit (*Lepus californicus melanotis*), loggerhead shrike (*Lanius ludovicianus*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), two striped garter snakes (*Thamnophis hammondi*), and coast horned lizard (*Phrynosoma coronatum*) (MSFC 2007a).

3.2 Cultural Overview

The scenic, rocky areas surrounding the SSFL have a rich cultural history ranging from legends of bandits and buried treasure, train robberies, and perilous stage rides, to ancient villages and Native American cave paintings.

The diverse topography and geology resulted in many distinct habitats, each with its own suite of natural resources. As a result of this environmental diversity, the region was intensively occupied by Native Americans from the earliest of the Chumash, Tongva, and Tataviam cultures.

The SSFL contains native pictographs and other cultural sites with significant archaeological resources, both in terms of science and culture. As noted in a Rocketdyne informational leaflet (Rockwell International, 1987):

“We were not the first. In a strangely prophetic way, a small tribe of American Indians called the Chumash occupied the rocky and somewhat forbidding hills that mark the northwestern corner of the San Fernando Valley at least 900 years before we shattered the stillness with the roar of rocket engines. Prophetic because the Chumash gazed upward from the two-thousand-foot elevation in an ancient practice of astrology. At a distance of nearly a millennium, the people that lived on The Hill actively addressed the stars. The methodology has changed. As the Twentieth Century rushes to a close, the Santa Susanna Field Laboratory is still vitally involved in the mystery of the night sky. But here and now we’re fashioning the transportation to actually approach the stars, as we have for almost forty years. Within our tenure, much of the essential history of the science of rocketry has been etched here in a continuing litany of smoke and fire, with the veritable household names of the American Space effort passing in review: Navaho, Atlas, Saturn, Thor, Delta, and the Space Shuttle Main Engine. The Hill has been The Laboratory for the birth, growth and maturation of American Rocketry, and one of the Nation’s foremost venues for proof-of-principle for the engines charged with providing access to Space.”

3.2.1 Prehistory

The prehistory of southern California can be divided into four main horizons: Early Man, Milling Stone, Intermediate, and Late Prehistoric.

Horizons are broadly defined segments of prehistory and their definitions are mainly fixed on the primary economic means of the times and the inferred level of social complexity. Horizons do not have clear

boundaries and those aspects of culture that are most characteristic of one horizon most often had their beginnings in earlier times. In addition, developments that characterize horizons did not occur uniformly in time or over space. Nevertheless, horizons do provide a useful framework for basic discussions of prehistoric developments.

The initial occupation of southern California took place during the Early Man horizon, and the earliest inhabitants seem to have been nomadic hunters and gatherers. The Early Man horizon begins at the end of the Ice Age, or Pleistocene Epoch, about 11,500 before present (BP) and ends approximately 8,000 BP. There is some archaeological evidence that the area was inhabited as early as 13,000 BP. Artifact assemblages dating to this horizon contain large projectile points and scrapers. People probably hunted and gathered for subsistence and lived in small nomadic groups.

The Milling Stone Horizon dates from approximately 8,000–3,000 BP. Assemblages include hand stones and milling stones, which indicate a diet based on plant foods as a result of a foraging subsistence. Artifacts include choppers and scrapers, but few projectile points. Archaeological sites from this horizon suggest that groups were semi-sedentary and occupied base camps for a portion of the year, while some members of the group traveled to seasonal camps with better access to resources. The Milling Stone Horizon is the earliest documented cultural period in Ventura County (WAL, 1955).

The Intermediate Horizon is a transitional period between 3,000 and 1,250 BP. There are few archaeological data for this horizon, particularly for the inland regions of southern California. It is similar to the Milling Stone, but assemblages include large stemmed or notched projectile points and mortars and pestles. The presence of projectile points indicates an increased emphasis on hunting, while the mortars and pestles indicate that the people harvested and processed acorns. Both of these practices allowed for greater sedentism.

Sedentism and population further increased during the Late Prehistoric Horizon, which began approximately 1,250 BP and ended with European contact in 1769. The archaeological assemblages are more complex and include small projectile points, which indicate the use of the bow and arrow, as well as steatite bowls, asphaltum (used to waterproof canoes),

grave goods, and shell ornaments. Bedrock milling stations, such as those at the Burro Flats Painted Cave site, were common. Hunting of deer and gathering of acorns continued to provide storable food resources (CH2M 2007).

3.2.2 Native American History

During the historic Aboriginal period, the areas surrounding Ventura County and the Simi Hills have been identified as a transition zone between the ethnographic territories of three culture groups: the Chumash, Tongva, and Tatavium. They are also sometimes referred to as the Ventureño/Chumash, the Gabrielino/Tongva, and the Fernandeseño/Tatavium, following the Spanish custom of naming local tribes after nearby missions. Figure 3-2 illustrates their locations with respect to each other and the Rancherias or villages that populated the tribal lands.

Most of the Native American groups presented here were organized in hunter/gatherer societies that were semi-nomadic throughout the region. Generally, they did not establish permanent villages, but rather occupied various regions and set up camp seasonally. Much of what is now known about these Native American groups prior to European contact is derived from the archaeological record. This is due in large part to the decimation the Native American groups experienced as a result of missionization, disease, conflict, and intermarriage. Although early Spanish explorers and mission clergy recorded information about the local Native American populations, professional anthropological studies were not begun until the end of the 19th century after virtually all of the southern California Indian groups had been either totally assimilated by Spanish, Mexican, and American cultures, or sent to reservations (HIS 2007a).

The Chumash Indians originally occupied the northern portion of the California bight and northward considerably beyond this prominent geographical feature. The California bight includes coastal southern California, the Channel Islands, and parts of the Pacific Ocean. The greatest concentration of Chumash ranged from western Los Angeles County to the southern half of San Luis Obispo County, and inland to southwestern Kern County (HIS 2007). As is the case with many if not most Native Americans, much of the recorded information about their culture comes from archaeological investigations, the records of early European explorers, and ethnographic data.



Figure 3-2 Approximate Locations of Tribal Lands.
(source: HAN 1981)

Estimates for the precontact population of most native groups in California have varied substantially. The 1770 population of the Chumash is estimated to be approximately 22,000. By 1900, the population had declined to just 200 (HIS 2007).

Two-thirds of the Chumash population lived near the coast and used marine fishing for subsistence. Hunting of land animals and gathering of wild plants, including acorns and various seeds, supplemented their marine diet. (SAN 2004)

In the rolling hills of the coastline, the Chumash found caves to use for sacred religious ceremonies. The earliest Chumash Indians used charcoal for their drawings, but as the culture evolved, they colorfully decorated the caves using red, orange, and yellow pigments. These colorful yet simple cave paintings included human figures and animal life. They used a technique of applying dots around the figures to make them more distinct. Many archaeologists believe that the cave paintings illustrate the spiritual bond the Chumash hold with the environment (SAN 2004).

As with most Native American tribes, the Chumash history was passed down from generation-to-generation through stories and legends. Many of these stories were lost when the Chumash Indian population was all but decimated in the 1700s and 1800s by the Spanish mission system.

The first direct contact with Europeans is thought to have taken place in 1542, during a voyage led by Juan Rodríguez Cabrillo. Between Cabrillo's visit in the mid-16th century and the late 18th century, the Chumash experienced limited contact with the crews of various ocean expeditions that intermittently sailed through their area (HIS 2007). In documenting the history of the Chumash Indians however, the excursions into southern California during the period between Cabrillo's voyage in 1542 and a Spanish land expedition led by Gaspar de Portolá into Alta California in 1769 are relatively insignificant. Historians and anthropologists use the two dates as historical markers, while the two and one-quarter centuries that lapsed between these events are called the "protohistoric" period (HIS 2007).

Portolá's 1769 expedition signified the start of the colonization of Chumash culture. Missionization of the Chumash, which took place from 1772 to 1822, resulted in the abandonment of many marine practices in favor of agriculture and animal husbandry. The Chumash population was eventually decimated, due largely to the introduction of European diseases. By 1831, the number of mission-registered Chumash was only 2,788, down from pre-Spanish population estimates of 22,000 (SAN 2004). By 1900, the population had declined to just 200 (HIS 2007).

After mission secularization in 1834, lands formerly under mission control were given to Spanish families loyal to the Mexican government. Other large tracts were sold or given to prominent individuals as land grants. Mexican authorities failed to honor their promise to distribute the remaining land among the surviving Chumash, causing further decline in the Chumash population.

By 1870, the region's now dominant Anglo culture had begun to prosper economically. The Santa Barbara area established itself as a mecca for health seekers, and by the turn of the century it became a haven for wealthy tourists and movie stars. Around 1880, the region began to establish itself as an important hub of agriculture and horticulture. Most of the Chumash

who remained in the area survived through menial work on area farms and ranches (SAN 2004). By 1900, the Chumash population had declined to just 200 (HIS 2007).

South of the Chumash Indians, the Tongva occupied an area that is now covered by Los Angeles County and parts of Orange County. The area extended to Aliso Creek and to southwestern San Bernardino County. They also occupied the southern Channel Islands: Santa Catalina, San Nicholas, San Clemente, and possibly Santa Barbara Island. Approximately 300–400 villages stretched up and down the coast of the Los Angeles basin, from Malibu in the north past Laguna Beach in the south, and inland to the San Gabriel Mountain foothills (GAB 2007).

Estimates for the precontact populations of Tongva have suggested a 1770 population of 5,000, and most subsequent scholars have accepted this estimate. Along with their Chumash neighbors to the north, the Tongva were among the few New World peoples who regularly navigated the ocean. They built seaworthy canoes, called *tí'at*, using planks that were sewn together, edge-to-edge, and then caulked and coated with either pine pitch, or, more commonly, the tar that was available either from the La Brea Tar Pits or asphaltum that had washed up on shore from offshore oil seeps (GAB 2007).

Tongva religious ceremonies were held in a circular structure within the village. The structure could only be entered by select males of status in the community and close relatives in the event of funerary ceremonies. Female singers were also allowed. Some rock art sites in the San Gabriel Mountains and in the northwestern San Fernando Valley were also used for Tongva ceremonies (HIS 2006).

When Spanish explorer Juan Rodríguez Cabrillo arrived off the shores of San Pedro in 1542 it was the Tongva who canoed out to greet him. As with the Chumash, between Cabrillo's visit in the mid-16th century and the late 18th century, the Tongva experienced limited contact with the crews of various ocean expeditions that intermittently sailed through their area (GAB 2006). The Spanish land expedition led by Gaspar de Portolá into Alta California in 1769 began missionization of the Tongva. Communities and culture fell into a rapid decline with the arrival of the Mission de San Gabriel in 1771. Many of the Tongva joined the mission (and the Missions San Fernando

and San Juan Capistrano) and, upon their conversions, were compelled to abandon their villages and culture. It was their association with the Mission San Gabriel that gave the Tongva their Europeanized name Gabrielino. By the time the first American settlers arrived in the Los Angeles area in 1841, Tongva survivors were scattered and working at subsistence level on Mexican land grants. In the second part of the 18th century, European disease further decimated the Tongva population. Today, it is estimated that a few hundred to a few thousand Tongva still live in California (HIS 2006).

Northwest of the Tongva (who occupied much of Los Angeles County) and east of the Chumash (who occupied much of Santa Barbara County) the Tataviam lived in the Santa Clarita Valley (Saugus, Newhall, Canyon Country). The Tataviam group lived primarily on the upper reaches of the Santa Clara River drainage system east of Piru Creek. Their territory may also have extended over the Sawmill Mountains to include at least the southwestern fringes of the Antelope Valley, which they apparently shared with the Kitanemuk.

The Tataviam were hunters and gatherers who prepared their foodstuffs in much the same way as their neighbors. Their primary foods included yucca, acorns, juniper berries, sage seeds, deer, the occasional antelope, and smaller game such as rabbits and ground squirrels (TAT 1978).

The Tataviam lived in winter villages that might have had as many as 100–150 inhabitants or more. At the time of the Spanish conquest of California, the total population was probably at least 1,000 (HIS 2007a).

There is no information regarding Tataviam social organization, though information from neighboring groups shows similarities among Tataviam, Chumash, and Tongva ritual practices. As their Chumash neighbors, the Tataviam practiced an annual mourning ceremony in late summer or early fall that was conducted in a circular structure made of reeds or branches (TAT 1978).

As with the other neighboring tribes, missionization of the Tataviam began around 1769. It was their association with the Mission Fernando that gave the Tataviam their Europeanized name Fernando/Tataviam. Today, it is estimated that a few hundred Tataviam still live in California (HIS 2007a).

Other Native American groups living in the area at the time of European contact included Kawaiisu, Kitanemuk, Serrano, and Yowlumne.

The Kawaiisu lived in regions of the Antelope Valley prior to European contact. As with other Native American groups in southern California, the Kawaiisu were a hunter/gatherer society, relying heavily on game, which included deer, birds, rodents, insects, and rabbits. According to one estimate, the population of this group may have been 500 people (undated). By 1984, less than 30 documented members of this group were living in southern California (KAW 1981).

The Kitanemuk were a small group located principally in the Tehachapi Mountains, extending eastward into the Mojave Desert around Rosamond Dry Lake. They also shared the western Antelope Valley with the neighboring Tataviam. Most members of the group were assimilated into the Missions San Fernando, San Gabriel, and possibly San Buenaventura. No population estimates are available for this group.

Most researchers place the Serrano in the San Bernardino Mountains east of Cajon Pass, at the base and north of the mountains in the desert near Victorville, eastward as far as Twenty-Nine Palms, then south into the Yucaipa Valley. The location of Serrano settlements was often determined by accessibility to fresh water. Families lived in circular, domed structures built of willow frames covered with tulle thatching. In addition to the family dwellings, each village had a large ceremonial house where the lineage leader lived. Other structures included storage and sweathouses.

Because the Serrano were located inland, European influence was not significant until after 1819 when a mission was established at present day Redlands. Between 1819 and 1834, most of the western Serrano Indians were forced into the mission system. Serrano traditions survived in locations more distant from Spanish influence, such as northeast of the San Geronio Pass. Population estimates for the Serrano range between 1,500 and 2,500 at the time of first contact with the Spanish.

The Yowlumne tribe of Yokuts made their home in present day Bakersfield, with the village centering between the Santa Fe Depot and Mercy Hospital. Village remnants and artifacts have been found in this area, even in recent years, indicating that earlier residents called this place home.

3.2.3 Area History

The Spanish occupation of California that began in 1769 furnished an epic in history. As shown in Figure 3-3, between 1770 and 1822, 21 Spanish missions were founded along the California coast between San Francisco and San Diego. Three missions, San Buenaventura, San Fernando Rey de Espana, and San Gabriel were established in the area surrounding SSFL. Father Junipero Serra founded the Mission San Buenaventura on March 31, 1782. The town that grew up around the mission is named San Buenaventura, which later became known as Ventura.

In 1822, Mexico gained independence from Spain, and California's officials pledged allegiance to Mexico. California land that had been vested to the King of Spain fell under the ownership of Mexico. The end of the Spanish rule over Mexico also led to the end of the missions' institutional role in California. By the 1830s, there were far fewer converts entering the mission system and the missions fell into neglect. Indian baptisms and marriages halted in 1836, as the mission lands passed out of church control and came under secular management (WIK 2007b).

Almost a decade of political confusion followed and, as tensions increased, American settlers began to revolt against Mexican authorities. On June 6, 1846, not knowing that the U.S. and Mexico had officially been at war since May 13th, the Californio rebels, took over the Mexican garrison at Sonoma. There, they hoisted a homemade flag bearing a crude likeness of a grizzly bear and the words "California Republic." Afterwards, on June 18th, a proclamation was issued outlining reasons for the "Bear Flag Revolt," declaring it was the rebels' intention to establish a republican form of government in upper California.

At first, it appeared that the conquest of upper California was complete and the Americans rejoiced that it had been done so effortlessly. But, as in New Mexico, once the inhabitants had time to recover from the shock, they decided to rise up against their new rulers—despite promises of prosperity and freedom under the U.S. flag.

Although there were some minor skirmishes with dissatisfied Californios in the northern part of the province, the rebels were strongest in the south. There, in October 1846, the Los Angeles garrison, commanded by Lt. Achibald Gillespie, was besieged by insurrectionists who took control of the town, causing

the Americans to retire in disgrace. Attempts by U.S. forces to retake Los Angeles during the fall of 1846 were unsuccessful.

The Mexican-American War, spanning from 1846 to 1848 ended with California becoming a U.S. Territory. California was admitted to the Union as the thirty-first state in 1850.



Figure 3-3. Spanish Missions of California.

After California became part of the U.S., the area's population increased greatly. Influenced by the Gold Rush and by statehood, more Americans wanted to travel to California. Stagecoach lines were efficient modes of transportation, especially when trekking within California. As increasing numbers of settlers

began arriving into the region, primarily during the 1849 Gold Rush, the territorial and later state and local governments realized the need for improved wagon roads between southern and northern California. The area's primary stagecoach line was the Santa Susana Pass, an extremely steep mountain pass that stagecoaches had to traverse when traveling the Overland Stage Road from Los Angeles to San Francisco. The town of Santa Susana became a relay station for the stagecoach lines where the drivers would trade in their tired horse before attempting to cross the Overland Stage Road (CHS 1991).

After the Civil War, land use throughout the San Fernando Valley shifted from large cattle ranches to smaller single-family-owned ranches and farms. In 1869, the former San Fernando Mission lands were divided in half along what today is Roscoe Boulevard. The southern half of the valley was sold to the San Fernando Farm Homestead Association, which had been formed by Isaac Lankershim. In 1874, the northern half of the valley was sold to Charles Maclay and George K. Porter. Porter then sold part of his land to his cousin, Benjamin F. Porter. Maclay planned to build a town on his share of the land, which later became the city of San Fernando. The Porter cousins planned to plant crops. Wheat quickly became the cash crop of the valley. As new homesteaders planted wheat, the landscape of the valley changed from sheep and cattle range land to golden wheat fields.

The San Fernando Valley was divided into 13 ranches, 7 of which were located in the southern half of the valley and 6 in the northern half.

After 1876, the Southern Pacific Railroad brought additional settlers into the valley, and provided the means to send their produce to markets. As a result, a number of small towns—Toluca, Burbank, Lankershim, and Santa Susana—sprang up (CHS 1991).

The area continued to grow into an independent agricultural community despite the problem of lacking water to irrigate their farms. In 1913, the city of Los Angeles delivered water from the Owens Valley to the San Fernando Valley.

After World War I, large fruit ranches began to dominate the agricultural industry. The area became known for its delicious crops of oranges, lemons, grapes, and figs. In addition, thoroughbred horse ranches were well known.

During the 1920s, the area became a backdrop for many of the western movies. The rugged scenery and its close proximity to Hollywood made the Santa Susana hills the ideal location for filming movies. Before World War I, local ranchers Karl and Augusta Iverson began renting out their ranch as a movie location. Many famous motion pictures were filmed at the Iverson ranch, including *Stagecoach*, *The African Queen*, *Around the World in 80 Days*, and *Wee Willie Winkie*.

After World War II, the population of the entire San Fernando Valley began to boom. People began to move to small towns and the first subdivisions were built to accommodate the influx. In 1951, industry moved to the San Fernando Valley with the building of the Santa Susana rocket-testing site of North American Aviation (NAA). The greatest period of growth in the area was the 1960s, marked by beginning of construction of the 787 ac (318.5 hc) planned industrial tract (CHS 1991).

3.3 Santa Susana Field Laboratory History

Prior to being developed, the SSFL site was used for ranching. Development of the land started in the early 1940s by NAA (a predecessor company of Boeing). NAA established the first test stands at the Santa Susana site during 1948 and 1949, immediately following the company's construction of related facilities in 1947 at the Los Angeles International Airport and Alamogordo Army Air Field (today's Holloman Air Force Base (AFB)). Personnel from NAA worked at Alamogordo/Holloman until late 1949, when its rocket engine testing in New Mexico shifted to the Bowl Area at Santa Susana. The test stands of the Bowl Area are often said to be derived from German design, as are NAA's test stands at Holloman AFB. After a construction hiatus for rocket and missile engine test facilities in the U.S. during the Korean War in the early 1950s, major new test sites augmented programs across the service arms of the Department of Defense (DoD) as of 1954. At Santa Susana, expansion included the Alfa, Bravo, Coca, and Delta test stand enclaves, with the composite group initially known as the Hot Test Acceptance Facility of NAA's Rocket Engine Field Laboratory (in 1954). During 1956, the Rocket Engine Field Laboratory transitioned in name to the Propulsion Field Laboratory (PFL). Under the direction, and as of 1958, ownership, of the Air Force, NAA's Rocket Engine Field Laboratory/PFL became Air Force Plant (AFP) 57 in 1957, coupled locally with AFP

56 in Canoga Park (where NAA manufactured rocket engines) and AFP 64 at Santa Susana (a liquid oxygen (LOX) manufacturing plant). Test stands in the Bowl Area complemented those of the Alfa-Delta group, as did NAA's Canyon Area test stands and its Component Test Laboratories (CTLs) to make the Santa Susana site a composite of Government-owned, contractor-operated (GOCO) facilities and corporate enterprise (NAA's contractor-owned, contractor-operated (COCO) test stands, laboratories, and ancillary facilities at the location) (MSFC 2008).

Nearly all rocket engine test and development in Areas 1 (the Bowl and Canyon Areas) and 2 (AFP 57) of the second half of the 1950s derived from the earliest rocket engines tested at Santa Susana, the Navaho and Redstone engines—which NAA, in turn, had created from the V-2 engine. Rocketdyne engineers uprated the Navaho engine from 75,000 pounds thrust to 150,000 pounds thrust for the Thor and Atlas engines, conducting development, test, and evaluation tasks at Santa Susana's AFP 57 for the Air Force during the second half of the 1950s into the early 1960s. Rocketdyne engineers also developed and tested the Jupiter intermediate-range ballistic missile (IRBM) engine for the Army. Test stand allocations for the ballistic missile engine testing at AFP 57 during 1955–1961 were as follows:

- **Alfa test stands:** Atlas on Alfa I (1955–1957), Atlas flight engine and Navaho engine on Alfa II (1956–1957), and firings of Thor (1955–1958), Atlas (1956–1957), Navaho (1956–1957), and Jupiter (1957) engines on Alfa III.
- **Bravo test stands:** Atlas (1956–1957) on Bravo I and II, developmental E-1 engine (1956–1959) on Bravo I, and static firing tests of the RS-2 on Bravo IIIB (1959).
- **Coca test stands:** Atlas engine on Coca I and II (1956–1957), Atlas engine on Coca II (1959), and a late version of the Navaho engine on Coca III (1956–1957).
- **Delta test stands:** Atlas on Delta III in 1957, static firings of the Jupiter engine on Delta I (1960–1963), and experimental Air Force rocket engines, including firings of the E-1 engine (1958–1960), the X-1 engine (1958–1961), and the X-4 engine (1960) on Delta II.

As of the late 1950s, with the transition of the National Advisory Committee to Aeronautics (NACA) to NASA, Air Force and Army missiles became the building blocks for propulsion systems to carry man into space. In 1958, a Jupiter C rocket, powered by a Redstone engine, carried the first American satellite, Explorer I, into orbit around the Earth. Late the same year, NASA initiated its Saturn I program. In 1961, NASA adapted a Redstone engine as a component of the propulsion system to launch the inaugural manned Mercury capsule. Beginning in 1961, NASA contracted with Rocketdyne for Large-Rocket Engine Systems to support its newly established Saturn Apollo program. In August 1962, MSFC and Rocketdyne negotiated a NASA Industrial Facilities contract to meet “requirements for the J-2, F-1, H-1, and S-II programs at (the) Canoga Park Propulsion Field Laboratory at Santa Susana, Edwards AFB, and Neosho, Missouri” for “(a)ll severable items acquired with NASA funds.” MSFC described its mid-1960s mission at Santa Susana as “the developmental testing of the S-II stage of the Saturn V vehicle, development and testing of the H-1 and J-2 engines, and components testing of the F-1 engine.”

In 1964, MSFC further summarized its facilities use as including the following:

- Two S-II stage test positions (on Coca I and IV).
- One F-1 components test stand (Bravo D).
- An F-1 components test laboratory (two modules at CTL V).
- An H-1 components test laboratory (two modules at CTL I).
- Three H-1 engine test stands (the Canyon Area).
- A J-2 components test laboratory (three modules at CTL III).
- Five J-2 engine test stands (VTS II and III in the Bowl Area; Delta I, II, and III) (NASA November 1965).

By 1966, MSFC, collocated with the Redstone Arsenal in Huntsville, had field operations in 20 buildings and structures in AFPs 57 and 64 (exclusive of small ancillaries), and 23 facilities owned by Rocketdyne. At midyear, MSFC had supervised the construction of four new buildings and structures in the Coca area and had made modifications to the Bravo I and II test stands, the Delta II test stand, and all five CTLs. NASA activities for Saturn (testing for the H-1 engine, and components of the F-1 and J-2 engines) at Santa Susana were most intense during 1964–1968 (see below). In 1968, about 90 percent of the “total contract

administration activity...(at AFP 57)...pertain(ed) to support for the National Aeronautics and Space Administration” (MSFC 2008).

The Bechtel Corporation, with the architectural-engineering work subcontracted to Ralph M. Parsons was responsible for the NASA improvements at AFP 57 (Area 2) during the middle 1960s. The most significant improvements occurred at the Coca site. NASA required two much larger test stands to handle the rocket engines in development as space boosters. The major added buildings and structures at Coca were as follows:

- Coca I (“completely reconstructed”).
- Coca IV (new).
- A blockhouse addition.
- An upper pre-test building.
- Two pill boxes.
- A gaseous hydrogen (GH₂) recovery vessel (the “eight ball”).
- A liquid hydrogen (LH₂) storage vessel.

Simultaneous with the construction of Coca I and IV, Rocketdyne had Coca II “dismantled to provide space” (“History of the Air Force Plant Representative, Rocketdyne Division,” North American Aviation, Canoga Park 1 July–31 December 1962: 18). Rocketdyne also augmented the row of tanks on Skyline Drive with a ninth larger tank that held 470,000 gallons of water (MSFC 2008).

In autumn 1969, NASA had begun its formal planning for the Space Shuttle Main Engine (SSME). Late in the year MSFC was assessing test stands at Santa Susana as infrastructure appropriate for the planned engine (Goodrum and Wade 1969; Mitchell September, October, and November 1969). NASA announced in mid-July 1971 that the agency had selected Rocketdyne to develop and manufacture the SSME. North American Rockwell had also received the contract for the shuttle’s orbiter (Marshall Star 23 August 1972: 1-2). In early 1972, NASA awarded Rocketdyne a 90-day letter contract to initiate work on the development and production of the SSME. Canoga Park was the designated manufacturing location for the engine. Before the close of the year, NASA provided \$15.4 million in additional monies to Rocketdyne to modify Coca I and IV for testing programs supporting the development and manufacture of the SSME.

A high-pressure gas storage vault was added to the Coca site in 1973. The SSME was a very powerful propulsion system that required larger and more modern test stands than those located at Santa Susana. Of Rockwell International’s existing test stands, only Coca I and IV were capable of further improvements for the SSME (without fully new construction). As of 1974, MSFC planned to use the following facilities at Santa Susana only for components testing of the developmental SSME as follows:

- The three test positions on Coca I.
- One position on Coca IV.
- CTL I (for SSME turbine testing).
- CTL III (for SSME ignition “proof and burst”).
- CTL IV (for SSME bearings tests).
- A materials test facility.
- A valve test facility.

In August 1973, Rocketdyne conducted the first preburner test for the SSME on the Coca IVA position, acknowledged within NASA as a shuttle development milestone (Rockwell International February 1974). Not until the late 1970s did static firings of a complete SSME occur at Santa Susana. NASA had chosen to have Rocketdyne run the acceptance tests of completed SSMEs at its Mississippi Test Facility (MTF) near New Orleans. (The MTF was subsequently renamed the National Space Technology Laboratories (NSTL) and today is known as the Stennis Space Center.) Rocketdyne ran components tests for the SSME at Santa Susana (primarily on Coca I and IV), and conducted static firings of the SSME on the (renamed) A-1 and A-2 test stands at the MTF (Plate 26). MSFC soon decided to add a third engine (rather than components) test stand to assist in Rocketdyne’s acceptance testing of manufactured SSMEs. NASA contracted to further modify the Coca I test stand at Santa Susana, renaming the facility Test Stand A-3. Rocketdyne rebuilt engine 0001, the first complete SSME fired at NSTL, at its Canoga Park plant, before redesignating the engine as 0201 and putting it in test on Test Stand A-3 (Coca I) at Santa Susana. Rocketdyne conducted the first test firing of a complete SSME at Santa Susana on the Coca I test stand, on November 7, 1978. The purpose of this initial firing was to check out the test stand and the rebuilt engine. In its redesignated role as Test Stand A-3, the Coca I test stand became the primary SSME test facility at Santa Susana (see Plate 25). In the late 1970s, Rocketdyne augmented the Coca site with several ancillary facilities to support Test Stand A-3, such as a pump building for a coal hydrogasification system.

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During the 1970s, activities at the Alfa, Bravo, Coca, and Delta sites were varied, and included the following:

- **Alfa test stands:** Atlas and Thor engines with Atlas booster and sustainer engines tested on Alfa I and Thor main block and Delta RS-27 engines tested on Alfa III, and with Alfa I deactivated for an undetermined period in mid-1973.
- **Bravo test stands:** Atlas and Delta RS-27 vernier engines on Bravo ID, with tests of Atlas sustainer turbopumps, Atlas booster engines, and Delta RS-27 turbopumps on Bravo II.
- **Coca test stands:** SSME on Coca I and IV.
- **Delta test stands:** The Linear Aerospike engine on Delta IIA (1970) and the Linear Engine Test Bed No. 2 on Delta IIB (in 1973) (“History of the Air Force Plant Representative Office North American Rockwell Corporation Rocketdyne Division Canoga Park,” California January 1 to June 30, 1973) and Lance engine on Delta III.

To greater and lesser degrees, the Alfa, Bravo, and Coca sites continued to host static firings for Rocketdyne during the 1980s and 1990s, with several locations active into the early 21st century. Test usage is summarized as follows:

- **Alfa test stands:** Atlas MA-5 engines on Alfa I (1982–2000) and Delta RS-27 and RS-27A engines on Alfa III (1980–2006, with a period of hiatus during the mid-1980s) (Rockwell International 1987 and NASA February 2006a).
- **Bravo test stands:** “Modified extensively (ca.1985) for the Delta RS-27 and Atlas programs to handle the acceptance testing of all turbopumps” (Rockwell International 1987), with continued tests run on Bravo I and II as in the 1970s (into 2005) (NASA February 2006b).
- **Coca test stands:** SSME on Coca I (Test Stand A-3) (into 1988).

Each cluster of test stands and individual test stands had periods of inactivity between 1955–1956 and 2006—sometimes very short, sometimes sustained. Permanent deactivation of test stands was underway at the four sites as of the 1970s. Delta was only minimally active after 1970, and was fully inactive at some point in the decade. Coca concluded its support of the SSME program in 1988, with subsequent activities at the location minimal. Bravo continued its missions for the Air Force Atlas and Thor (Delta RS-27) space

booster engines into 2005. Alfa was both the oldest (first) test area at AFP 57 (Area 2) and the longest lived. Late missions at Alfa paralleled those at Bravo. Alfa I was not deactivated permanently until 2000, while Alfa III was still in use in early 2006 (MSFC 2008).

3.4 Santa Susana Field Laboratory Current Operations

SSFL's ongoing mission areas on federally-owned property include RCRA cleanup activities, property disposal activities, and historic and cultural resources management.

4. Cultural Resources Inventory

4.1 Criteria for Establishing Significance

The NRHP is the official list of recognized cultural resources that are important reflections of our heritage. These resources represent the major patterns of our shared local, state (or commonwealth), and national experience (National Park Service (NPS) 1995). Cultural resources listed on, or determined eligible for listing on the NRHP include historic and prehistoric archeological sites, buildings, structures, objects, districts, and traditional cultural properties. According to 36 CFR Section 60.4 (Criteria for NRHP Evaluation), cultural resources (referred to as properties in the regulations) can be defined as significant (i.e., eligible for the NRHP) if they “possess integrity of location, design, setting, materials, workmanship, feeling, and association,” and if they satisfy at least one of the following criteria:

- A. Are associated with events that have made a significant contribution to the broad pattern of history.
- B. Are associated with the lives of persons significant in the past.
- C. Embody distinctive characteristics of a type, period, or method of construction, or represents the work of a master, possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction.
- D. Have yielded, or may be likely to yield, information important in prehistory or history.

The NPS provides technical information and guidelines for evaluating NRHP eligibility in several published bulletins. The initial qualification used for identifying potentially significant cultural resources is the 50-year minimum age necessary for inclusion in the NRHP (36 CFR Section 60.4). The process for evaluating cultural resources for eligibility for the NRHP includes categorizing the resource as a district, a site, a building, a structure, an object, or a traditional cultural property; determining the appropriate context (prehistoric or historic) for the resource; determining whether the resource is significant under the NRHP criteria for evaluation; and determining whether the resource retains integrity. After a cultural resource has been assigned to a category (i.e., district, site, building, structure, or object), the researcher must identify the historic context represented by the resource. According to the NPS, “the significance of a historic property (cultural resource) can be judged and explained only when it is evaluated within its historic context.” Evaluating a cultural resource within its

historic context involves several steps. These steps are defined by Savage and Pope (1998:7–8) and include the following:

- Identifying the themes, geographical limits, and chronological period that the resource represents.
- Determining how these themes are significant in the history of the area, state, or Nation.
- Determining whether the particular resource type is important in illustrating these themes through historic associations, architectural or engineering values, or information potential.
- Determining the features that the resource must have in order to reflect these themes (Savage and Pope 1998:7–8) (MSFC 2007).

4.1.1 National Register Exceptions

The following cultural resources are not to be included on the NRHP:

- Archeological sites that do not retain sufficient integrity to contribute significant data.
- Buildings and structures not in their original locations.
- Properties that have been torn down and rebuilt.
- Commemorative properties.
- Properties that have only achieved significance within the last 50 years.

Cemeteries and grave sites, religious properties, moved properties, birthplaces, reconstructed properties, commemorative properties, and properties achieving significance within the last 50 years must meet specific conditions before being considered eligible under the following criteria for NRHP evaluation.

Criteria Consideration A: A religious property is eligible if it derives its primary significance from architectural or architectural distinction or historical importance.

Criteria Consideration B: A property removed from its original or historically significant location may be eligible if it is significant primarily for architectural value or if it is the surviving structure most importantly associated with a historic person or event.

Criteria Consideration C: A birthplace or grave of a historical figure is eligible if the person is of outstanding importance and if there is no other appropriate site or building directly associated with his or her productive life.

Criteria Consideration D: A cemetery is eligible if it derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events.

Criteria Consideration E: A reconstructed property is eligible when it is accurately executed in a suitable environment and presented in a dignified manner as part of restoration master plan, and when no other buildings or structure with the same association has survived.

Criteria Consideration F: A property primarily commemorative in intent can be eligible if design, age, tradition, or symbolic value has invested it with its own historical significance.

Criteria Consideration G: A property achieving significance within the last 50 years is eligible if it is of exceptional importance.

4.1.2 Architectural Resources

Architectural resources that might be judged significant under Criterion A (significant events), or Criterion B (significant persons), can be assessed as eligible for the NRHP through archival research. Historic structures that are associated with significant persons or events in local, state, or National history should be definitively linked with important persons or events to determine eligibility. Historical documentation of the person(s) or event(s) is usually enough to support NRHP eligibility.

Evaluation of architectural resources that might be judged significant under Criterion C (architectural merit) generally involves detailed description and assessment of physical characteristics. Most NRHP-eligible architectural resources are considered to be significant because they exhibit “distinctive characteristics of a type, period, or method of construction” (36 CFR Section 60.4(c)). These characteristics include: “a pattern of features common to a particular class of resources; the individuality or variation of features that occurs within the class; the evolution of that class; or the transition between classes of resources.” Vernacular architectural resources often exhibit distinctive characteristics that represent a type, period, or method of construction. However, many of these resources have been substantially altered within the last 50 years, and few retain aspects of integrity required to be considered eligible for the NRHP.

Considering architectural resources significant under Criterion A because they “represent the work of a master” (36 CFR Section 60.4(c)) requires that the property “express a particular phase in the development of the master’s career, an aspect of his or her work, or a particular idea or theme in his or her craft” (Savage and Pope 1998:20). A “master” may also be an anonymous craftsman whose work is discernable from others by its distinguishing characteristics and “rises above the level of workmanship of the other properties encompassed by the historic context” (MSFC 2007).

If architectural resources exhibiting distinctive stylistic characteristics cannot be positively attributed to the work of a master, the resources may still be eligible for the NRHP. These buildings, structures, or objects may be eligible because they “possess high artistic values.” High artistic values are most often interpreted to represent resources that epitomize the design principles of a particular architectural style or a transition between two architectural styles (MSFC 2007).

To be considered eligible for the NRHP, architectural resources must exhibit good integrity; that is, a property must retain its ability to convey its significance. Seven aspects of integrity defined in the regulations (36 CFR Section 60.4) include location, design, setting, materials, workmanship, feeling, and association. If these aspects are diminished and an architectural property no longer retains the identity or character for which it can be judged significant, then the architectural resource is not eligible for the NRHP due to loss of integrity (MSFC 2007).

4.1.3 Archeological Resources

Archeological sites are usually evaluated relative to Criterion D. Archeological sites are potential sources of important information as locations of human activities that include physical remains of those activities. Some archeological sites, particularly those representing historic period occupation or use, can be considered eligible under Criterion A (if they are associated with specific important events or trends in American history), under Criterion B (if they are associated with important people), or under Criterion C (if important structural elements are preserved).

As indicated in 36 CFR Section 60.4(d), archeological sites “that have yielded, or are likely to yield, information important in prehistory or history “can be eligible for the NRHP. The National Park Service defines the

following two requirements for archeological sites to be eligible under NRHP Criterion D (MSFC 2007) as follows:

1. The site must have, or have had, information to contribute to our understanding of human history or prehistory.
2. The information must be considered important.

The NPS provides clarification for the first requirement by stating that an archeological site is eligible for the NRHP if that site “has been used as a source of data and contains more, as yet unretrieved data” (MSFC 2007).

Regarding the second requirement, Glassow (1977) recommends careful consideration of specific site attributes (integrity, clarity, artifact frequency, and artifact diversity) in determining whether an archeological site contains important information. Butler (1987:821) defines “important information” as the potential of an archeological site to contribute to current “theoretical and substantive knowledge” of archeology in the site’s regional setting. In other words, under Criterion D, importance or significance can be defined as research potential. The research potential of an archeological site (lacking architectural remains) can be determined by demonstrating that the site retains relatively intact archeological contexts such as culturally or temporally diagnostic artifacts, intact features, discrete artifact clusters denoting activity areas, or preserved organic material associated with the site occupation. To be considered eligible, these data should be capable of addressing important research questions by testing hypotheses, supporting current scientific interpretations, or reconstructing cultural chronologies through the use of appropriate analytical methods.

Aspects of integrity are also important in determining NRHP eligibility of archeological sites. However, because “archeological sites, in particular, do not exist today exactly as they were formed” (MSFC 2007) and information potential relies less on overall condition of the site, location and association are the most important aspects of integrity for archeological sites.

To be eligible for the NRHP, an archeological site must possess artifacts in or near their original depositional location that can be employed to determine the past use of the locale and the approximate date of its past use. Integrity of location indicates occurrence of artifacts, artifact clusters, middens, or features in

sufficient numbers to permit quantitative assessments of their horizontal and vertical distributions across the site. These cultural deposits must occur within relatively intact soil deposits that represent specific human activities, suites of activities, or natural events that occurred on the site. The relationships between cultural and natural remains are critical to understanding how the site was created (i.e., the kinds of human activities that occurred at the site to produce the artifacts and features) and how the site has changed since its initial occupation. The presence of artifacts and features that can be employed to make these interpretations is essential to recommending a site eligible for the NRHP.

Integrity of association is interpreted somewhat differently when referring to archeological sites. Integrity of association is measured in terms of the strength of the relationship between the site’s data or information and the important research questions.”

It is important to note that one must evaluate the ability of an archeological site to generate information beyond that already known (i.e., its research potential). If artifacts and features encountered at a newly discovered site occur at numerous previously recorded sites in a region, then the new site is not expected to generate new information. This site could be recommended ineligible for the NRHP even though it may contain adequate numbers of temporally and/or functionally sensitive artifacts within intact natural or cultural deposits. Alternatively, a site that produces extremely rare artifacts or evidence of extremely rare activities may be considered eligible even if it lacks these associations.

4.2 Previous Archeological Research and Recorded Sites

CH2M Hill conducted two comprehensive cultural resources records searches at the California Historical Resources Information System (CHRIS) for NASA to gather pertinent data regarding the archaeological sites on federally-owned property at SSFL. A CHRIS search would result in the acquisition of record forms for the known or recorded archaeological and historic sites, copies of previous archaeological survey reports, and overviews and context statements for the vicinity. The CHRIS search also should yield copies of historic maps. A Web search to seek other pertinent information about the prehistory and pre-1930s to 1940s history of SSFL was also performed (CH2M 2007).

The first search was completed on April 12, 2006, by Sarah Galaz, staff researcher, South Central Coastal Information Center (SCCIC) of the CHRIS, located at California State University in Fullerton (SCCIC # 6432.3672). Thomas Shackford, lead staff researcher (SCCIC # 7048.4251), completed the second search on November 14, 2006. The CHRIS staff reviewed all of the recorded archaeological sites in areas I and II and the cultural resource reports on file. The California Points of Historical Interest, the California Historical Landmarks, the California Register of Historical Places, the NRHP, and the California State Historic Resources Inventory listings were also reviewed (CH2 2007).

The most striking, but not surprising, result of the CHRIS searches in 2006 was that virtually none of NASA's Area II and little of Area I had ever been subject to a systematic archaeological survey by professional archaeologists. Almost all of the archaeological investigations conducted to date focused on the pictograph rock art locality situated in the southwestern corner of NASA's Area II (Figure 3-1); even those investigations were limited in scope and few and far between. As described by Hwangbo (1995): There has been much archeological research in this general area of the SSFL, with the first significant published accounts being those by Moore (1915) and Fowke (1928) (MSFC 2007).

In the early 1950s, Charles La Monk and Gordon Redfelt, members of an active amateur archaeological club known as the Archaeological Survey Association (ASA) of South California, visited the SSFL and brought archaeological attention to the pictographs. La Monk published a brief report in Volume 1 of their club's newsletter in 1953. Recognition of the significance of the paintings prompted another short article to be subsequently published about the site by Dr. Charles Rozaire, in the *Ventura County Historical Society Quarterly* (1959). Though from the Los Angeles County Museum, Rozaire was an advisor to the ASA. He also recorded the site with the University of California Los Angeles (UCLA) Archaeological Survey, then the regional clearing-house for site records and maps. Rozaire elected to record each separate component of the archeological location as a distinct entity, resulting in official designations known as site

trinomial, running from CA-VEN-151 to 161. However, the archaeological location was popularly known as Burro Flats, due to its proximity to this named feature on the United States Geological Survey (USGS) topographical quadrangle, and it is still widely called that by archaeologists to this day (W&S 2007).

In 1973, Franklin Fenenga conducted an archaeological resource survey of the complex for the Rocketdyne Division of Rockwell International. Although Rozaire recorded 11 different sites (CA-VEN-151 through 161), Fenenga (1973:6) interpreted the site complex as a series of special-use areas incorporated in a single site, which represented the remains of the modifications of the landscape by a single community. He then reclassified the sites as "galleries" and "features."

In early 1983, the existing archaeological collection for the Burro Flats Painted Cave housed at the Southwest Museum was loaned to John and Gwen Romani and Dan Larson. Rozaire provided a copy of his field map from the ASA and his own excavations and some of the level records from his 1959 and 1960 field class. In conducting a preliminary analysis of Burro Flats materials, Romani, Romani, and Larson (1988:102–106) reported the following findings:

- Burro Flats Painted Cave was first occupied from at least A.D. 1100 until ca. A.D. 1810 to 1820, although its occupation may extend back in time to as early as A.D. 900.
- Burro Flats Painted Cave contains evidence of a range of activities indicating that it may have been a permanently occupied village.

In 1993, Albert Knight revised the fairly complicated series of site records and trinomial originally established by Rozaire in 1960. Instead of 10 separate site designations, Burro Flats now has the single official trinomial of CA-VEN-1072, with the previous 10 sites understood as loci—prehistoric activity areas and features—within a larger village. Knight's records describe the site as six panels of pictographs found in rock shelters of different sizes and a series of bedrock mortar (BRM) locations, linked by a large and partly discontinuous archaeological deposit, or midden (W&S 2007).

More recent cultural resource studies at SSFL include two surveys in preparation for the closure of facilities on Boeing land and an evaluation of the current condition of the Burro Flats Painted Cave site. C. William

Clelow and Michael Walsh (1999) reported that an intensive surface survey and subsurface testing of a 5.5-acre parcel in the southern end of Boeing's Area IV found no prehistoric or historic cultural resources.

W and S Consultants subsequently conducted an intensive surface survey of the entire Boeing Area IV in 2001 (Division of Toxic Substances Control [DTSC], 2006). This study is not included in the CHRIS records of studies conducted in the vicinity of the project area, but it did confirm the absence of cultural resources in the southern end of Boeing's Area IV. In 2006 and 2007, Dave Whitley of W and S Consultants also conducted an evaluation of the current condition of pictographs at the Burro Flats Painted Caves site as a basis for a future evaluation of deterioration or adverse impacts (Whitley, 2007).

CH2M Hill conducted the most recent study of federally-owned property on SSFL in 2008 on behalf of NASA. The goals of the survey were to better understand the nature and extent of the previously recorded Burro Flats Painted Cave site in NASA's Area II and to identify previously unrecorded cultural resources on the lands owned by NASA.

Most of the survey was conducted as an intensive pedestrian survey, with crew members walking transect intervals of no more than 30 m. Areas that were too steep to traverse or those that were on developed land were subject to reconnaissance through a visual inspection, in which the archaeologists entered those areas accessible by foot but did not survey them intensively; or through a windshield survey, in which archaeologists looked for rock shelters and evidence of other above-ground resources from afar. The vicinity of the Burro Flats Painted Cave site was surveyed intensively using site records.

The crew was able to evaluate approximately 80 percent of the acreage in NASA's Area I and 40 percent of Area II. Because of safety concerns, the steep, rocky terrain was not inspected. Many of these areas were at high elevations and would have offered no water, giving them a low probability of containing cultural resources. Although crew members wore Tyvek suits, high concentrations of poison oak prevented entrance into some areas and the thick vegetation also prevented visual inspection of the ground surface. Sites were recorded using State of California Department of Parks and Recreation (DPR) forms

(DPR 523). Digital photos of the site and artifacts were taken, and drawings of the artifacts were made. Features and artifacts were recorded using a GPS.

During this survey, archaeologists located a previously unrecorded prehistoric site in the southeastern corner of Area II. The site consists of a shallow sandstone rock shelter and associated artifacts. The rock shelter is southerly facing and lies at the base of a slope in Bell Canyon just 85 ft (26 m) east of an ephemeral stream that flows into Bell Creek. The site is 98-ft (30-m) long, 49-ft (15-m) wide, and covers 0.11 acres. At 1,800 ft (549 m) above msl, it is in one of the lowest portions of the project area. Artifacts include a Grimes Canyon fused shale biface, a gray quartzite chopper, and a gray quartzite core. The site appears to have been affected in the recent past by wildfire and wind and water erosion, and, because of its proximity to roads, may have been subject to looting, although there was no visible evidence of unauthorized excavation. A review of the survey by the CA SHPO determined that the CA SHPO did not concur with the recommendation of eligibility due to the sparsity collection of artifacts and an interpretation of the site as seasonal. NASA agreed with CA SHPO's recommendation to treat the site as potentially eligible for the purpose of any proposed undertakings. The report resulting from this survey also compiled reports from Rozaire, Knight, Fenenga, and Whitley to accurately locate and describe 24 individual features within the Burro Flats Painted Cave site.

4.3 Architectural Inventories and Assessments

A historic resources survey of the NASA facility at SSFL conducted in January 2008 included an initial review and reconnaissance of the 139 federally-owned buildings, structures, and sites within Area II of the SSFL. With the exception of one well, no facilities are located within Area I. The archival research and field survey resulted in six test stands (i.e., buildings 727, 729, 730, 731, 733, and 787) located in the Alfa, Bravo, and Coca test areas, and three associated control houses (i.e., buildings 208, 213, and 218) and three historic districts (Alfa, Bravo, and Cocoa) being evaluated as meeting the NRHP eligibility criteria. The relevant historic contexts include Cold War (Military) and Space Exploration from the mid-1950s to 1991. In addition, because the buildings have achieved exceptional importance within the past 50 years, Criteria G applies (MSFC 2008).

5. Management Plan

5.1 Policies and Responsibilities

As noted earlier in this document, all federally owned or controlled installations having statutory and regulatory cultural resource management responsibilities must prepare and implement a CRMP. Efficient CRMP implementation at SSFL requires participation by Center directors and the Natural and Cultural Resources Manager (Environmental Engineering and Occupational Health Office, (EEOH)). The following sections review their responsibilities.

After stating that “every NASA employee is responsible for complying with environmental regulations,” NPR 8500.1A (NASA Environmental Management) provides lists of responsibilities for NASA organizational elements. Under NPR 8500.1A, Center directors are responsible for the following:

- Ensuring that the Center and each component facility under their management cognizance have a designated environmental manager with a direct line of authority from the appropriate Center official.
- Providing sufficient qualified staff and resources required to perform environmental activities.
- Ensuring effective development and execution of environmental training, to professional development and education initiatives, that will promote the knowledge and proficiency of the NASA workforce in environmental conservation and efficiency management concepts and techniques.
- Implementing Agency environmental functional leadership activities, policies, regulations, and procedural requirements.
- Reviewing and overseeing all environmental activities.
- In collaboration with the NASA Headquarters Office of Institutional and Corporate Management, establishing oversight and evaluating Center operations through functional reviews, performance metrics, or other means to ascertain that appropriate environmental compliance and management techniques are used for the identification, documentation, evaluation, and disposition of all environmental requirements for programs, projects, facilities, systems, and operations.

In addition, according to NPD 8500.1 (Section 5e), the SSFL Natural and Cultural Resources Manager, or CRM, is responsible for the following:

- Advocating, managing, and allocating assigned environmental program resources, both for Environmental Compliance and Restoration (ECR) and Center resources;
- Serving as the local source of expertise on environmental policies, procedures, requirements, and processes.
- Supporting functional reviews as necessary to ensure that Center programs, projects, facilities, systems, and operations comply with all environmental requirements.
- Coordinating with all internal organizations to ensure compliance with the law and effective implementation of environmental policies, procedures, and processes.
- Serving on the NASA Engineering Management Board (EMB) as a voting member and participating in environmental management panel working group activities as coordinated and approved by local and Headquarters senior management.
- Reporting information regarding environmental management activities to the Assistant Administrator for Institutional and Corporate Management or designee.

5.2 Compliance With Laws and Regulations

SSFL complies with all laws and regulations pertaining to the identification, management, and preservation of cultural resources. All activities, including the issuance of leases and licenses, that conform to these laws and regulations, among which are NEPA; NHPA; AIRFA; ARPA; NAGPRA; EOs 11593, 13007, and 13287; 36 CFR Part 800; and 36 CFR Part 79. NPR 8580.1 directs Centers to include cultural resources considerations as part of the NEPA documentation process.

The SOPs in this CRMP were developed to guide the day-to-day activities at SSFL. As appropriate, consultations will be conducted with the ACHP, the CA SHPO, appropriate THPOs, and interested parties.

5.3 NASA Center Coordination and Review Procedure

NASA Center organizational elements, tenants, and other parties identified by the Center Director must coordinate with the CRM early in the planning of projects to review undertakings, conduct appropriate studies as necessary, determine if historic properties are present, and conduct the appropriate consultations with the CA SHPO, THPOs, ACHP, or other interested parties. The CRM must first determine if the proposed action is an undertaking and then determine the area

of potential effect (APE). The CRM must then apply the criteria of effect and adverse effects to determine whether undertakings at SSFL will affect historic properties. Planning such projects may proceed with the understanding that changes in design or delays may occur where mitigation must be applied as a result of consultation. The CRM must consult in a timely manner with the CA SHPO and THPOs concerning all undertakings that have the potential to affect historic properties not otherwise excluded by a PA or a memorandum of agreement (MOA).

5.4 Native American Graves Protection and Repatriation Act Compliance

In compliance with NAGPRA, the CRM must maintain an accurate and up to date inventory of Native American human remains, funerary objects, or sacred objects. It is the responsibility of the Center Director and the CRM to begin repatriation consultations on materials identified during inventories. If Native American human remains are found during project undertakings, further work in the vicinity will cease for 30 days to allow for consultation with THPOs, as required by NAGPRA.

5.5 Review, Monitoring, and Reporting

Copies of all documents pertaining to cultural resources management at SSFL must be kept on file by the CRM, including, but not limited to, correspondence, memoranda on file, published and unpublished technical reports, annual compliance reports, maps, site records, and lists of properties. The CRM is to file reports in accordance with separately developed agreements and interagency agreements.

A concise report is to be made available to the Center Director. This report may contain such information as the number of NHPA actions taken; the number of no effect, no adverse effect, or adverse effect determinations, foreclosures, and terminations; the number of NHPA actions in consultation and their status; any PAs and/or MOAs developed under 36 CFR Part 800; the number of NEPA considerations of cultural resources and outcomes; problems with the overall program; deficiencies; and expected program costs.

5.6 Standard Operating Procedures

Each of the following SOPs is a set of rules that outline responsibilities and identify specific actions the SSFL must take to ensure compliance with one or more Federal laws or regulations. Each SOP is triggered by a specific kind of proposed undertaking (e.g., the proposed modification or demolition of a historic building), an occurrence (e.g., the discovery of human bones in a backhoe trench), or a compliance goal (e.g., completion of the mandated inventory). Topics for the 10 SOPs are as follows:

1. Maintenance, repair, alteration, demolition, or leasing/licensing of existing buildings.
2. Assessing the effects of and mitigating adverse effects resulting from ground disturbing undertakings.
3. Responding to inadvertent discovery of archeological deposits.
4. Treatment of human remains and funerary/sacred objects.
5. Identification and nomination of eligible properties to the NRHP.
6. Compliance review and monitoring.
7. ARPA compliance and preventing vandalism to archaeological sites
8. Protection and preservation of known archeological sites.
9. External Section 106 consultation or coordination with the CA SHPO.
10. Curation of archaeological matters.

Each SOP is targeted at ensuring compliance with a specific law(s) and/or regulation(s). For example, SOP #4 is designed to ensure compliance with the NAGPRA. Each SOP is prefaced by an introduction, a list of applicable laws/regulations, and by a policy statement(s). The procedures themselves are presented in an "if-then" outline format.

5.6.1 SOP #1: Maintenance, Repair, Alteration, Demolition, or Leasing/Licensing Existing Buildings

Maintenance, alteration, renovation, and demolition of buildings can result in adverse effects to historic properties. Reducing or withdrawing maintenance from a historic building is considered an adverse effect and the leasing or licensing of historic buildings may cause adverse effects due to changed management procedures. In compliance with Section 106 of the NHPA and its implementing regulations, this SOP specifies procedures to implement in planning such undertakings. This SOP is applicable to NRHP listed, eligible, and potentially eligible properties.

Applicable Laws/Regulations/Procedural Requirements

- National Historic Preservation Act.
- National Environmental Policy Act.
- NASA Procedural Requirements 8580.1.

Policy

- The SSFL shall proactively protect and preserve NRHP-eligible historic buildings, structures, and districts. The HPO shall periodically inspect the condition of all NRHP-eligible buildings, structures, and districts to monitor the compliance of undertakings and to ensure that deterioration through neglect or natural disasters has not adversely affected the properties. Deterioration will be documented in writing and photographically and will be reported to the CA SHPO.
- Avoidance of adverse effects to NRHP-eligible historic buildings at the SSFL shall be proactively incorporated into the planning process.
- Until such time as the CA SHPO has concurred with NASA's determination that a historic building is ineligible for inclusion to the NRHP, it will be treated as potentially eligible.
- All buildings and structures listed on or considered eligible for inclusion to the NRHP shall receive priority and regular maintenance to prevent deterioration through neglect.
- Maintenance, repair, alterations, and demolition of historic buildings must comply with the Secretary of the Interior's standards and guidelines for building rehabilitation.
- Procedures covered herein apply to both in-house work and contracted work.

General Procedures

Before proceeding to Step I listed below, the SSFL CRM must first determine if the proposed action is an undertaking and also specify the APE. The SSFL HPO shall review all planned undertakings that may result in adverse effects to historic buildings. These include plans, specifications, and work orders; specifications for maintenance, repair, and alterations; and demolition to any buildings or structures.

- I. If the SSFL determines that the proposed undertaking will not affect historic properties, the HPO will send documentation to the CA SHPO for review, notify consulting parties, and make documentation (as specified in 36 CFR Part 00.11(d)) available for public inspection, allowing 30 days for review.
 - A. After the review period, the HPO will consult to resolve objections (allowing approximately 30 days) or forward findings to the ACHP for review and opinion, allowing 30 days for ACHP review.
 - B. After ACHP review, the HPO will take into account the ACHP's opinion, prepare a summary of decision (including rationale for decision and evidence of consideration), and provide this document to the ACHP, the CA SHPO, THPOs, and consulting parties. If the decision is "No Effect," this completes the Section 106 process.
- II. If the SSFL determines that the proposed undertaking will not adversely affect historic properties, the CRM will propose a no adverse effect finding to the CA SHPO and THPOs, notify consulting parties, and provide documentation specified in 36 CFR Part 800.11(e), allowing 30 days for review.
 - C. After the review period, consult with appropriate parties to resolve objection (allow approximately 30 days) or forward findings and documentation to ACHP for review and opinion (allow 15 days), notify consulting parties, and make documentation available to the public (allow 15 days).
 - D. After ACHP review, the CRM will take into account the ACHP's opinion, prepare a summary of decision (including rationale for decision and evidence of consideration) and provide this document to the ACHP, the CA SHPO, THPOs, and consulting parties. If the decision is "No Adverse Effect," this completes the Section 106 process.

- III. If the undertaking effect is unknown, then the CRM will consult maps, lists, and other records as may be appropriate to determine the NRHP-eligibility status of the property that may be affected.
- E. If no determination of NRHP eligibility has been made for the building or structure, then the CRM shall ensure completion of an evaluation by appropriate personnel. Further planning of the undertaking may proceed with the understanding that the determination of eligibility may require design changes or Section 106 consultation.
- F. If the building or structure has been determined as not eligible for inclusion on the NRHP, and if the CA SHPO has previously concurred with this determination, then the CRM may allow the action to proceed without further action.
- G. If the building or structure has been evaluated as eligible for inclusion to the NRHP, either individually, as a member of a thematically based district, or as a contributing member of a geographically based district, and the CA SHPO has concurred with this evaluation, the following management standards are applicable:
1. Maintenance operations and materials must be sympathetic to the historic fabric of the structure.
 2. Repairs should be made with materials of like kind (color, texture, hardness, style, etc.) that do not detract from the historic integrity of the building or structure.
 3. Alterations shall follow the Secretary of the Interior's Standards and Guidelines for Building Rehabilitation, and should adhere to the following:
 - a) Massing shall be of similar setbacks and rhythm of the original building.
 - b) Volume shall be consistent with the original building.
 - c) Profiles and facade setbacks shall be complementary to the original building.
 - d) Windows and doors shall be of similar openings and style to that of the original.
 - e) Materials and units assemblies shall be of similar color, texture, and style to those utilized in the original.
 4. Demolition of some NRHP-eligible or listed historic buildings or structures will require the preparation of an MOA between NASA, the CA SHPO, and the ACHP, as specified under III-B1.
- IV. If the adverse effect of any undertaking on a historic building or structure cannot be avoided through the above procedures, SSFL shall implement one of the following alternative actions, depending on the urgency of the undertaking.
- H. The SSFL may redesign the project to avoid any adverse effect. The redesign process will include feasibility and economic analyses for rehabilitation and reuse.
- I. The SSFL may proceed with a mitigation plan.
1. The SSFL shall develop an MOA with the SHPO, specifying the scope and level of effort required to mitigate the adverse impact of the project on the property in question. One possible mitigation measure will be recordation of the property to HABS-HAER standards.
 2. Mitigation plans shall take into account cost and mission requirements and shall be based on a balancing of economics and public interest. The SSFL may request comments from the ACHP and may develop and implement actions that take into account the effects of the undertaking and the comments of the CA SHPO, THPOs, and the ACHP. If the CA SHPO indicates that the property is significant and the effects of the undertaking on the property are serious, then The SSFL shall make reasonable efforts to minimize harm to the property until such time as the Section 106 process is completed.

Lessees/Licensees

Any leasing/licensing of historic buildings must follow the same guidelines outlined above. The lessee/licensee will notify the CRM of any proposed rehabilitation or structural alteration to historic properties or to the landscape/landscape features and will provide a detailed description of the undertaking prior to any rehabilitations/alterations. Within 30 days of receipt of such notification and adequate supporting documentation, the CRM will notify the lessee/licensee in writing that the undertaking conforms to the standards and that the lessee/licensee may proceed or that the undertaking does not conform to the standards and that the lessee/licensee may not proceed. If the CRM determines that the undertaking does not meet the standards, the CRM may, with the assistance of the lessee/licensee, fulfill the requirements of Section 106 of the NHPA and its implementing regulation, Protection of Historic Properties (36 CFR Part 800). The lessee/licensee will not undertake the proposed

action until the CRM notifies the lessee/licensee that the requirements of Section 106 have been fulfilled and the lessee/licensee may proceed. If the CRM objects to the lessee's/licensee's proposed undertaking, the CRM will notify the lessee/licensee that the proposed action may not proceed.

5.6.2 SOP #2: Assessing the Effects of and Mitigating Adverse Effects Resulting From Ground Disturbing Undertakings

Every undertaking that disturbs the ground surface has the potential to adversely affect known archaeological deposits. Natural resource management activities such as habitat management (e.g., food plots, cover plantings, and pond construction), forest management activities (e.g., harvesting and planting), and land rehabilitation activities (e.g., erosion control, restoration and remediation) are activities that have the potential to adversely affect known archaeological sites. In compliance with Section 106 of the NHPA, NEPA, NAGPRA, AIRFA, and ARPA, this SOP outlines the policies and procedures to be followed when planning such undertakings.

Applicable Laws/Regulations/Procedural Requirements

- National Historic Preservation Act.
- National Environmental Policy Act.
- Native American Graves Protection and Repatriation Act.
- American Indian Religious Freedom Act.
- Archaeological Resources Protection Act.

Policy

- Until such time as NASA has determined an archaeological site to be ineligible, all known sites will be treated as potentially eligible; therefore, they will be avoided wherever possible.
- All machine aided excavations or other earth moving projects shall be designed to avoid damage to archaeological sites or other historic properties that may be eligible for inclusion in the NRHP.
- The avoidance or mitigation of adverse impacts to NRHP eligible sites shall be proactively incorporated into the design and planning process, rather than deferred until archaeological deposits may be discovered during actual construction.
- It is the responsibility of the digging contractor to contact any cable, optical fiber, or telephone company before beginning excavation.
- The digging is event specific and permits cannot be reused at another work site or reused at the same

site at another time after the original work has been completed.

- NASA shall afford Native American tribes the opportunity to participate as interested persons in the Section 106 process when an undertaking is found to affect properties having historic value to that tribe (see 365 CFR 800.1(c)(2)(iii)).

Procedure

All planned construction projects that may result in disturbance to the ground surface shall be reviewed by the CRM and/or contracted Archaeologist. To ensure compliance with Section 106 of the NHPA, NEPA, NAGPRA, AIRFA, and ARPA, the following procedures should be followed:

- I. Prior to beginning any digging, the personnel to do the digging will obtain a digging permit from the SSFL project manager.
 - A. The personnel doing the digging will contact the occupants of the surrounding buildings to determine what cable, optical fiber, or phone lines are being used in order to locate underground services.
 - B. The personnel doing the digging will contact any cable, optical fiber, or telephone company before beginning excavation.
 - C. When digging on the SSFL, proceed with utmost caution. If unidentifiable material that is unrelated to utilities is discovered, digging should stop and the SSFL Facilities Office should be notified to provide assistance in identifying the material.
- II. If the proposed undertaking's effect is not known, then the CRM and/or consulting archaeologist will determine whether the APE has been archaeologically inventoried and concurred with by the SHPO.
 - A. If the proposed undertaking involves removing or remediating buried hazardous waste or other potentially dangerous materials, then no pedestrian or ground intrusive inventory is to be conducted within the APE, except as may be warranted for the emergency discovery of archaeological deposits.
 1. SSFL personnel or their contractors who work in an APE that has not been surveyed because of the potential for buried hazardous waste or other potentially dangerous materials must use the minimum amount of excavation to uncover and assess the waste or other hazardous material.

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- B. If an area must be surveyed where there is the potential for buried hazardous waste or other potentially dangerous materials, the SSFL or its contractor must prepare a safety and health plan in accordance with SSFL guidelines.
- C. If an archaeological inventory has not been completed and concurred with by the SHPO for the APE, the CRM shall ensure that professional archaeologists complete an inventory. Further planning of the undertaking may proceed while the inventory is being completed with the understanding that the discovery of potentially eligible archaeological sites may require Section 106 consultation and a change in the plans or further archaeological testing. When the inventory is completed, the report of findings will be submitted to the CA SHPO for concurrence. If there are no archaeological sites in the project area and the CA SHPO has concurred with the report findings, the project may proceed.
- D. If an archaeological inventory has been completed and accepted by the SHPO for the APE, the CRM and/or consulting archaeologist shall determine whether the undertaking will affect a known archaeological site.
 - 1. If no archaeological site has been recorded within the APE, or if all archaeological sites that may be affected by the undertaking have been determined by NASA to be not eligible for inclusion in the NRHP and the CA SHPO has concurred, then the CRM may allow the excavation to proceed without further action, except responding to the discovery of inadvertent archaeological deposits.
 - 2. If a potentially eligible site will be impacted, then NASA will develop a testing plan in coordination with the SHPO. Excavation and other disturbances in the vicinity of the site will be suspended until an agreed testing procedure has been carried out and sufficient data has been gathered to allow a determination of eligibility and the CA SHPO has concurred with NASA's determination of eligibility.
 - 3. If any archaeological sites that may be affected by the undertaking have been determined by NASA to be eligible for inclusion in the NRHP, then the CRM shall coordinate with the SSFL Project Office to determine if the undertaking can be redesigned or relocated to avoid adverse impact to historic properties.
 - a) If the undertaking is redesigned or relocated to avoid adverse impacts, the CRM may allow the undertaking to proceed without further action, except as may be warranted for the emergency discovery of archaeological deposits.
 - b) If the undertaking cannot be redesigned or relocated, NASA shall implement one of the following alternative actions, depending on the urgency of the undertaking being planned.
 - 1) NASA may relocate the project to avoid adverse effect. New locations shall also be inventoried and tested for eligible properties if they have not been inventoried.
 - 2) NASA may proceed with a data recovery plan under an MOA with the SHPO. The MOA shall specify the scope and level of effort of data recovery required to mitigate the adverse impact of the project on the site in question.
 - 3) NASA may proceed with a data recovery plan without negotiating an MOA when data recovery is expected to be limited, straightforward, and amenable to informal coordination among NASA, the SHPO, and the Principal Investigator responsible for the data recovery effort.
 - 4) When the recovery of Native American human remains or funerary objects is deemed likely, NASA may initiate excavation in compliance with NAGPRA. Such excavations shall be coordinated with interested Native American tribal groups if Native American remains are found.
 - c) NASA may request comments from the ACHP and may develop and implement actions that take into account the effects of the undertaking and the comments of both the SHPO and the ACHP. If the SHPO and the ACHP both indicate that the property is significant and the effects of the undertaking on the property are serious, then NASA shall make reasonable efforts to minimize harm to the property until such time as the Section 106 process is completed.

- III. If the proposed undertaking is listed as “of no effect,” then the CRM or consulting archaeologist will write a journal note to the work order, and the undertaking may proceed.

5.6.3 SOP #3: Responding to Inadvertent Discovery of Archeological Deposits

Regardless of whether an archeological inventory has been completed and regardless of whether a planned undertaking has been assessed for its effect on known historic properties, every undertaking that disturbs the ground surface has the potential to discover buried and previously unknown archeological deposits. This SOP outlines the policies and procedures to be followed in such cases.

Applicable Laws/Regulations/Procedural Requirements

- National Historic Preservation Act.
- National Environmental Policy Act.
- Archeological and Historic Preservation Act.
- Archeological Resource Protection Act.
- Native American Graves Protection and Repatriation Act.
- NASA Procedural Requirements 8580.1.

Policy

- Archeological deposits that are newly discovered during any undertaking shall be evaluated for their NRHP eligibility.
- Until the SSFL has determined an archeological site is ineligible, all known sites will be treated as potentially eligible and will be avoided insofar as possible.
- In the event that an archaeological deposit is inadvertently discovered, work must cease, the CRM must be notified, and a professional archaeologist must be consulted.
- If the professional archaeologist recommends that the archaeological deposit is potentially eligible, the CRM will consult with the CA SHPO on the need for further testing and/or data recovery.
- If the undertakings may affect properties having historic value to any federally recognized Indian tribes with which NASA consults, the CRM will consult with the tribes and give them an opportunity to participate as interested persons during the consultation process.
- In the event that human remains are inadvertently discovered, work must cease in the area of the discovery and the CRM must be notified.

Procedure

- I. Workers will notify the CRM immediately upon the discovery of possible archaeological deposits. (Standard language will be placed in contracts requiring contractors to notify the CRM immediately upon discovery of possible archaeological deposits.)
- II. When notified of the possible discovery of unexpected buried archeological material, the CRM will arrange to have a professional archeologist evaluate the site. Work will cease and the site will be protected pending the results of the evaluation.
 - A. If fossils, natural stones, concretions, or other such items that are sometimes mistaken for archeological materials are recovered, then the CRM may allow the excavation to proceed without further action.
 - B. If disturbances to the deposit have been slight and the project can be relocated to avoid the buried site, the CRM shall have the site recorded and forms submitted to the California State Site File, in a routine manner, having avoided adverse impact through relocation of the proposed undertaking.
 - C. If the location of the project cannot be changed, the CRM shall contact the CA SHPO by telephone or email, to report the discovery and initiate emergency consultation.
 1. If the deposits are evaluated as ineligible for inclusion on the NRHP by a professional archeologist, then the SSFL will prepare a memorandum for record, to be included in the site record. The SSFL may allow the excavations to proceed and shall advise the excavation foreperson(s) of the possibility and nature of additional discoveries that would require immediate notification of the CRM.
 2. If, in the opinion of the professional archeologist, the existing information is deemed insufficient to make a determination of eligibility, then an emergency-testing plan will be developed by the SSFL in coordination with the CA SHPO. Further excavation in the vicinity of the site will be suspended until an agreed testing procedure has been carried out and sufficient data has been gathered to allow a determination of eligibility.
 - a) If the CA SHPO and SSFL CRM agree after testing that the site is ineligible for

inclusion to the NREP, then work on the project may resume.

- b) If the site appears to be eligible for inclusion on the NRHP, or if the SSFL and the CA SHPO cannot agree on the question of eligibility, then the SSFL shall implement the following alternative actions, depending on the urgency of the action being delayed by the discovery of cultural material.
 - 1) The SSFL may relocate the project to avoid adverse effect.
 - 2) The SSFL may proceed with a data recovery plan under an MOA with the ACHP, the CA SHPO, and THPOs. The MOA shall specify the scope and level of effort of data recovery required to mitigate the adverse impact of the project on the site in question.
 - 3) The SSFL may request comments from the ACHP and may develop and implement actions that take into account the effects of the undertaking and the comments of the CA SHPO, THPOs, and the ACHP. Interim comments must be provided to the SSFL within 48 hours and formal comments within 30 days.

III. If examination by a professional osteologist indicates the materials are of human origin, an archaeologist must make a field evaluation of the primary context of the deposit and its probable age and significance, record the findings in writing, and document the materials with photographs and drawings as warranted.

- A. If at any time human remains, funerary objects, or Native American sacred objects are discovered, the CRM will ensure that the provisions of NAGPRA and/or AIRFA are implemented.
- B. The CRM will begin consultation with federally-recognized tribes.

5.6.4 SOP #4: Treatment of Human Remains and Funerary/Sacred Objects

The NAGPRA requires the inventory of human remains and funerary and sacred objects recovered from Federal lands that may be subject to claim by Native American tribal groups. The NAGPRA also requires active consultation with such groups to determine the disposition of such remains and objects. No Native American human remains or sacred/funerary

objects are currently known to exist on the SSFL; however, previously undocumented excavations may have encountered human remains and/or sacred/funerary objects and future undertakings may inadvertently encounter these materials. This SOP outlines the policies and procedures to be followed to ensure future compliance with the NAGPRA.

Applicable Laws/Regulations

- Native American Graves Protection and Repatriation Act.
- American Indian Religious Freedom Act Policy.
- No Native American human remains, funerary objects, or sacred objects from the SSFL will be knowingly kept in Government possession without preparation of an inventory and initiating consultation.
- Consultation regarding the disposition of Native American human remains, funerary objects, or sacred objects shall be initiated as soon as feasible.

Procedure

The CRM will ensure that the SSFL complies with NAGPRA requirements and the implementing regulations (43 CFR Part 10).

- I. The CRM will review all records to determine whether any human remains, funerary objects, or sacred objects originating from the SSFL are known to exist.
 - A. If no such objects are found, no consultation is required.
 - B. If any such objects are found to be uninventoried, the CRM will prepare an inventory of all such objects and will initiate consultation procedures with the Archeological Assistance Division, National Park Service (Post Office Box 37127, Washington, D.C. 20013; telephone 202-343-4101; facsimile 202-523-1547) to determine appropriate disposition.
- II. If human remains or artifacts that are not currently in Government possession but that are suspected to be from the SSFL are returned to the Government, the CRM will arrange to have a qualified professional examine and evaluate them.
 - A. If the remains are not of human origin, then no further action by the CRM is necessary.
 - B. If the remains are not of Native American origin, then they will be treated as stipulated as an emergency discovery of archeological deposits (see SOP #3).

- C. If the remains are of Native American origin, then the CRM will prepare an inventory of the remains and initiate consultation procedures with the Archeological Assistance Division, NPS.

III. If human remains are discovered during the course of any undertaking, the following procedures will apply:

- A. Work will immediately cease in the vicinity of the human remains.
- B. The site supervisor will immediately notify SSFL Law Enforcement/Center Protective Services and the CRM.
 - 1. If SSFL Law Enforcement/Center Protective Services officers determine that the remains are of recent origin, then no further action by the CRM is necessary.
 - 2. If the remains are not recent, the CRM will arrange to have a professional archeologist visit the site in a timely manner to examine and evaluate the recovered material.
 - a) If the remains are not of human origin, then no further action is necessary by the CRM and the undertaking may proceed.
 - b) If the remains are not of Native American origin, then the site will be treated as the discovery of emergency archeology deposits. However, it should be noted that not all human remains, cemeteries, etc., are NRHP properties.
 - c) If the remains are of Native American origin, then further work in the vicinity will be suspended for 30 days to allow for consultation, as required by the NAGPRA. If any photographs are taken of the undertaking, only general photographs of the site area are to be taken. Prior to removal of any remains, the CRM will prepare an inventory of the remains and will immediately initiate emergency consultation procedures with the Archeological Assistance Division, NPS.
 - 1) If consultation allows the remains to be removed, then the CRM will cause the remains to be treated and disposed in accordance with the consultation.
 - 2) Notwithstanding the results of consultation, the CRM will ensure that Section 106 procedures are adhered to with regards to evaluating sites.

5.6.5 SOP #5: Identification and Nomination of Eligible Properties to the National Register of Historic Places

Section 110 of the NHPA and EO 11593 direct Federal agencies to locate, inventory, and evaluate all NRHP-eligible sites, buildings, districts, and objects under their control and to prepare and submit NRHP nominations to the Secretary of the Interior. Current NASA policy is to nominate only those historic properties that are exceptionally significant and/or are accessible for public interpretation and use. Comprehensive survey has determined that there are nine individual NRHP-eligible architectural resources (buildings, structures), three historic districts, and one NRHP-listed archeological site.

Applicable Laws/Regulations

- National Historic Preservation Act.

Policy

- The SSFL will establish a program to evaluate historic properties (districts, buildings, structures, objects, archaeological sites, etc.) that are potentially eligible for listing on the NRHP.
- Persons who meet the Secretary of the Interior's guidelines for professional qualifications (36 CFR Part 61) will conduct all inventory, evaluation, and nomination activities.
- Exceptionally significant eligible historic properties will be submitted to the keeper of the NRHP as personnel and budgetary constraints permit.

Procedure

The HPO/CRM shall annually review the status of inventory, testing, and nomination and shall develop priorities for these programs based on integration with Section 106 responsibilities and funding availability.

- I. Archeological and architectural research and reevaluations shall be designed to ensure collection of sufficient archeological, architectural, and historical information with which to make a determination of eligibility for inclusion on the NRHP, according to the significance criteria outlined in Part 4 of this CRMP.
- II. For each archeological or architectural resource inventoried and evaluated as eligible or potentially eligible, the CRM shall seek the concurrence of the CA SHPO and the keeper of the NRHP, as appropriate.

III. For each “exceptionally significant” historic property recommended, with concurrence by the CA SHPO, as eligible for inclusion on the NRHP, the CRM will ensure that NRHP nomination forms are prepared and submitted to the keeper of the NRHP.

5.6.6 SOP #6: Compliance Review and Monitoring

Coordination and consultation with the CA SHPO, appropriate THPOs, and the ACHP is a key aspect of Section 106 cultural resource compliance at the SSFL. Technical information regarding undertakings and cultural resources must be provided to the CA SHPO and the THPOs in a timely manner to prevent foreclosure of a CA SHPO/THPO opportunity to comment.

Applicable Laws/Regulations

- National Historic Preservation Act.
- National Environmental Policy Act.
- Archeological and Historic Preservation Act.
- Archeological Resource Protection Act.
- American Indian Religious Freedom Act.
- Native American Graves Protection and Repatriation Act.
- EO 11593.

Policy

- In requesting CA SHPO and THPO consultation, the SSFL shall provide technical information regarding undertakings and cultural resources to the CA SHPO and THPO in a timely manner.
- The SSFL CRM will routinely monitor the compliance of the SSFL with applicable cultural resource laws and regulations.
- When the SSFL, the CA SHPO, THPOs, and/or the ACHP disagree about the recommendations for eligibility or any other portion of a compliance document, the SSFL shall take steps to ensure the protection and preservation of affected properties until the consultation process is complete.

Procedure

- I. Proposed mitigation or treatment projects will be coordinated with the CA SHPO and appropriate THPOs through the submission of draft reports.
 - A. Where the CA SHPO and THPOs concur with the proposed plans, the final report will reflect that concurrence.
 - B. Where the CA SHPO or THPOs do not concur with the proposed plans, the SSFL will continue to consult to reach agreement. When agreement

cannot be reached, the ACHP may be asked to resolve the disagreement and the disagreement will be so noted in the final report.

- C. In cases of actions under Section 106 of the NHPA, if there is no effect on the properties by the proposed undertaking, then the CA SHPO and THPOs have 30 days from the receipt of the draft report for review and comment. In cases of actions under Section 106 of the NHPA, if there is no adverse effect on the properties by the proposed undertaking, then the CA SHPO, THPOs, and the ACHP each have 30 days from the receipt of the draft report for review and comment. If no comments are received, the concurrence of the CA SHPO and THPOs is assumed.

5.6.7 SOP #7: Archeological Resource Protection Act (ARPA) Compliance Review and Preventing Vandalism to Archaeological Sites

The ARPA of 1979 makes it a felony for persons to excavate, remove, damage, or otherwise deface any archaeological resource or paleontological remains located on Federal lands. Exceptions to this law require a specific Federal permit. The US Army Corps of Engineers (USACE) issues permits for ARPA related work on military controlled lands.

An ARPA permit is not required for excavation, survey, etc., in direct support of mission requirements or for activities that are conducted exclusively for purposes other than the excavation and/or removal of archaeological or paleontological remains if found in an archaeological context (e.g., excavation of a building foundation), even when such activities may result in the disturbance of such remains. However, in such cases, the SSFL must comply with the requirements for Section 106 consultation.

Applicable Laws/Regulations

- Archeological Resource Protection Act.

Policy

- The excavation or removal of archaeological artifacts or paleontological remains, other than that conducted by NASA in direct support of a mission, under a valid testing program, is prohibited except as conducted under a valid ARPA permit.
- The CRM will proactively preserve and protect all known archaeological sites.
- The CRM will ensure that any interests that federally recognized Indian tribes may have in the

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permitted activity are addressed in a manner consistent with the requirements of NHPA and NAGPRA, prior to issuance of the permit.

- All excavated archaeological artifact collections and associated records will be permanently curated in a curation facility that meets the requirements of 36 CFR 79.
- The consulting archaeologist will review all applications for ARPA permits.
- The participation of interested Indian tribes and other members of the interested public will be sought for undertakings or actions that may affect archaeological sites or sites of religious and cultural significance (ARPA 16 U.S.C. 47 cctcj),

Procedure

- I. Non-NASA entities who propose to conduct archaeological survey and/or testing on the SSFL must submit an application for an ARPA permit to the SSFL CRM. They must:
 - A. Include a clearly written proposal that documents the information required under 32 CFR 229.6 and 32 CFR 229.8. The application must:
 1. Have the proposed project area clearly marked on a U.S.G.S. 7.5-ft quadrangle map.
 2. Include in the documentation an up-to-date review of prior archaeological research conducted in the area for which an ARPA permit is requested.
 3. List all sites recorded in the proposed project area.
 4. State the current status of NRHP eligibility for each site listed.
 5. For each site listed, provide a reference citation for the report of survey and state the status of SHPO concurrence for that report.
 6. Present the information in 1 through 4 above in an easy-to-read table format.
 - B. Be in accordance with SSFL guidelines.
- II. The application must be reviewed by the CRM and consulting archaeologist.
- III. A permit may be denied if:
 - A. The proposed work is deemed by NASA to be unnecessary or unwanted.
 - B. The application is technically inadequate.
- IV. If a permit is denied:
 - A. The applicant must be advised of the reason for denial.

B. If the denial is for technical reasons, the applicant must be advised of his/her right to resubmit the application.

- V. The Native American tribes on the SSFL's consultation list must be notified.
- VI. The CRM and/or consulting archaeologist shall monitor work conducted under ARPA permits to ensure compliance with the terms of the permit.
 - A. A permit may be revoked if:
 1. The applicant has not complied with the terms of the permit.
 2. The applicant has misrepresented the work to be accomplished.
 3. Continuance of the work is a hazard to public health or safety.
 4. Continuance of the work impairs any military function
 - B. Appeals will be forwarded to the Center Director for review by the CRM. The Center Director will sign the Determination of Appeal.
- VII. The SSFL shall proactively protect and preserve archaeological sites. The Security Officer on the SSFL patrols the installation for potential property violations and would contact the CRM. The PMO investigates and prosecutes ARPA violations when and if they occur.

5.6.8 SOP #8: Protection and Preservation of Known Archeological Sites

When an archeological inventory has been completed and a site has been assessed as eligible for listing on the NRHP, long-term management, preservation, and protection of the site must ensure that activities at the site are assessed for their potential effect. Every undertaking that disturbs the ground surface has the potential to affect archeological deposits. This SOP outlines the policies and procedures to be followed.

Applicable Laws/Regulations/Procedural Requirements

- National Historic Preservation Act.
- National Environmental Policy Act.
- Archeological and Historic Preservation Act.
- Archeological Resource Protection Act.
- Native American Graves Protection and Repatriation Act.
- NASA Procedural Requirements 8580.1

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Policy

- Adverse effects from undertakings on eligible archeological sites will be avoided insofar as possible.
- Archeological sites will be preserved to prevent deterioration insofar as possible.
- Public access will be limited to prevent destruction and/or damage.
- Publication of archeological site locations will be limited.

Procedure

- I. The SSFL CRM will periodically examine and evaluate the archeological sites and record degradations. Although natural weathering processes that promote deterioration of archeological sites cannot be prevented, eligible and potentially eligible archeological sites require management to ensure preservation and protection to the extent possible. Some visible signs of degradation of the listed archeological site at the SSFL include the following:
 - A. Exfoliation of the rock surfaces due to natural weathering processes and seasonal movements of moisture and salts.
 - B. Hard-fixed dust that accumulates as a result of human or animal foot traffic in the immediate vicinity or originates in natural wind. Although the dust degrades the painted panels because it obscures the visibility of the motifs to a certain degree, it also helps stabilize the art relative to the next observed weathering process.
 - C. Wind abrasion and erosion: Some galleries have experienced substantial wind abrasion. This has obliterated portions of the lowest lying paintings that are now truncated by this natural process. This abrasion is somewhat matched by hard-fixed dust.
 - D. Insect nests that cover portions of the painting: Removing them would potentially harm or destroy the painted area covered, and they are best left in place.
 - E. Possible bullet scars and incised graffiti: While it is possible to “reintegrate” graffiti to disguise it by filling in scratched surfaces with natural pigments that match the pictographs, it is probably not necessary with the small amount of degradation that has occurred in this manner.
 - F. Daily exposure to sunlight and ultraviolet (UV) rays has resulted in heavy fading in all but the main gallery.
- II. To ensure that the archeological sites at the SSFL do not suffer from any inadvertent or intentional human destruction or damage, visits to the site are strictly controlled. To further assist caretakers of the site, the following guidelines have been developed:
 - A. Two weeks prior to a requested site visit, the requestor must present to the SSFL CRM the purpose for site access. Examples include, but are not limited to, academic research, community interest in the SSFL site cleanup and/or its future use, unspecified Government officials and contractors needing access for monitoring or assessing the site, and tribal representatives interested in visiting for religious, ceremonial, or heritage purposes.
 - B. Designated NASA personnel and team members required to make routine visits for inspection, maintenance, and data collection of wells, associated springs, and pipelines necessary to assess, monitor, and regulate the site shall be granted access to the area after appropriate training is completed.
 - C. An authorized escort who has knowledge of the cultural aspects of the site and is familiar with the sensitivity of the site shall accompany all other site access.
 - D. Access to the site requires walking on rough terrain; therefore, all visitors are required to wear appropriate clothing and shoes.
 - E. Visitors to the Burro Flats archeological sites shall be educated regarding proper preservation of rock art. This education shall be accomplished with a previsit lecture and brochure.
 - F. No ground disturbance activities shall take place at any archeological site. If artifacts are discovered, they must be left in place and the CRM must be notified of their whereabouts.
 - G. No entry to any cave on an archeological site is permitted.
 - H. Cameras are permitted.
 - I. Backpacks, daypacks, purses, etc., shall be kept a minimum of 50 ft from the cave to avoid scraping. Implements necessary to aid in walking, such as a cane, shall be noted and allowed.
 - J. No food or drink is permitted within 50 ft of the cave.

- K. An administrative file will be maintained by the SSFL CRM to record all visits. The record will reflect date, time, number of visitors and their affiliation, and the identification of the escort.
- L. No entry to archaeological sites at the SSFL shall be allowed for a minimum of 7 days after a rain event (excluding security).
- M. A waiver from this process may be granted if accompanied by sufficient rationale.

5.6.9 SOP #9: External Section 106 Consultation or Coordination with the California State Historic Preservation Office (CA SHPO)

The following SOP is based on 36 CFR 800 in effect:

Applicable Laws/Regulations

- National Historic Preservation Act.
- Native American Graves Protection and Repatriation Act.
- American Indian Religious Freedom Act.

Policy

- The Environmental Engineering and Management Office (EEMO) is responsible for coordination with external regulatory agencies that regulate environmental and cultural resource programs. Tribal representatives must be included.
- Project managers are required to coordinate internally with the EEMO before they begin work on any projects or undertakings.
- The CRM in the EEMO is designated as the point of contact (POC) for the Section 106 process undertaken at the SSFL, including those projects proposed by organizations that are subject to the Section 106 process.
- All consultation required under Section 106 and NAGPRA must be completed prior to beginning the project.
- Historic properties include districts, buildings, sites, structures, or objects that are listed in, or are eligible for listing in, the NRHP. Historic properties may also include traditional cultural properties or Native American sacred sites. A property that is eligible for listing in the NRHP receives all the regulatory protection of a property that is listed in the NRHP.

Procedure

The following SOP is based on the standard Section 106 procedure outlined in 36 CFR 800.

- I. The Section 106 Procedure in General:
 - A. Section 106 of the NHPA, as amended, requires Federal agencies to consider the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation (the Council) a reasonable opportunity to comment on undertakings that may have an adverse effect. The Section 106 process must be completed for undertakings that affect historic properties at the SSFL prior to starting work. Initiating the Section 106 process in a project's early planning stages allows the fullest range of options to minimize or mitigate any adverse effects on historic properties. The goal of the NHPA is to preserve historic properties for future generations to the extent possible. Historic properties are nonrenewable resources that illustrate the history of the U.S.
 - B. The SSFL has no historic architectural properties listed in the NRHP but does have architectural properties that are eligible for listing in the NRHP. Eligible historic architectural properties consist of districts, individual buildings, and test stands. There is one archaeological site at the SSFL that was listed in the NRHP in 1975. If a property has been surveyed and the CA SHPO has concurred with the determination that the property is not eligible for listing in the NRHP prior to the undertaking, then no Section 106 review is required.
 - C. The CRM at the EEMO will determine the presence or absence of historic properties. The CRM has the final responsibility for making the "determination of effects" that a project or undertaking may have on historic resources. There are three possible outcomes: no effect, no adverse effect, and adverse effect. The following examples outline various projects and their potential effects on historic properties.

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No Effect	
Historic Building: Painting exterior elements the same color, planting landscaping, or upgrading utilities on the inside of the building if no visible changes are made to the exterior.	Archaeological Site: Installing overhead power or lines, removal of an underground storage tank (if the excavation is limited to the area of the original excavation).
No Adverse Effect*	
Historic Building: Replacing original slate roof with new in-kind materials (generally replacing original materials with in-kind replacements), building addition that is similar in materials and design, altering the use of a building.	Archaeological Site: Routine maintenance and sampling in established impact areas (previous activities would have disturbed soils), maintaining existing landscaping, installing a fence (generally, light construction with limited grading or subsurface soil disturbance).
Adverse Effect	
Historic Building: Demolition, replacing original wooden windows with metal windows, altering character defining features, incompatible design for additions or new construction in historic area, introducing a visual element such as a communications tower to a historic area (this visual intrusion can have a large area of potential effect).	Archaeological Site: Disturbing subsurface soils (i.e., through new construction or soil removal), installing a below ground utility line through a site, erosion of a site (while this is a natural process, it still damages sites), illegal "pot hunting" or excavation without a permit.

*Generally, maintenance and repair work that is done in accordance with The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings are considered no adverse effect undertakings.

1. Once a determination of effect has been made, the CRM at the EEMO initiates consultation under Section 106. The Federal agency provides project-related information to the SHPO for review with the Federal agency's determination of effect. Depending upon the type of effect, the length of the SHPO review varies. The shortest length of review time is 30 days for no effect and no adverse effect; however, there is no established timeline for an adverse effect. All consultation required under Section 106 must be completed prior to beginning the project.
2. Consulting parties in the Section 106 process include the CHC as the SHPO, and other consulting parties. Consulting parties may include, as appropriate, Tribal Historic Preservation Officer, Native American tribes, representatives of local governments, individuals or organizations with a demonstrated interest in the effects of the undertaking on the historic properties, and the public. The ACHP also may choose to be a consulting party where the Federal agency has determined that there will be an adverse effect. The Federal agency must give the ACHP an opportunity to become a consulting party in findings of an adverse effect.
3. Tribal representatives must be included in the scoping process for assessing environmental impact. Other Native Americans, including traditional cultural leaders, may participate as interested parties. Impacts to treaty rights and resources important in sustaining Native

American activities, such as plant harvesting, hunting, fishing, and water rights should, as appropriate, also be considered in the NEPA process. NEPA requires Federal agencies to request comments of Indian tribes (40 CFR 1503.1(a)(ii)).

4. The SSFL will not coordinate with Native Americans on undertakings involving historic buildings and structures unless the undertaking will involve an eligible prehistoric archaeological site.
- II. Section 106 Compliance Procedure:
- A. The procedure set forth below defines how the SSFL meets these statutory requirements based on the standard regulations. The Section 106 process consists of four primary steps:
 1. Step 1: Initiate Section 106 Process:
 - a) Establish undertaking: The CRM will determine whether the proposed action or activity meets the definition of an "undertaking" (Section 800.16[y]) and, if so, whether it is a type of activity that has the potential to cause effects on historic properties. The SSFL personnel, contractors, and project managers must consult with the CRM to determine whether a proposed action constitutes an undertaking. An undertaking is defined as a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency (36 CFR 800.16(y)). An undertaking will have an effect on a historic property

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when the action has the potential to result in changes to the character or use of the historic property within the area of potential effects. Historic property means any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the NRHP, located in the area of potential effects (36 CFR 800.16(1)). The area of potential effects is defined as “the geographic area(s) within which an undertaking may directly or indirectly cause changes in the historic character or use of historic properties, if any such properties exist” (36 CFR 800.16(d)).

- (1) No potential to cause effects. If the undertaking has no potential to cause effects on historic properties, the CRM has no further obligations under Section 106 and the action may proceed. The CRM should document a decision for internal information and to provide information should an outside interest make inquiry.
 - (2) Potential to cause effects. The undertaking is determined to have the potential to cause effects on historic properties. Continue the consultation process. Go to 2.
- b) Coordinate with other reviews. The CRM coordinates the Section 106 review, as appropriate, with the installation Master Planning Office and with any other required reviews (i.e., NEPA and NAGPRA). The CRM may use information from other review documents to meet Section 106 requirements.
 - c) Identify the SHPO. The California Historical Commission is the SHPO for the SSFL for consultation. If the undertaking affects federally recognized Native American tribes, then the Tribal Historic Preservation Officer of those tribes that have a Tribal Historic Preservation Officer may also be consulted.
 - d) Plan for public involvement. In consultation with the SHPO, the CRM will plan for involving the public in the Section 106 process.
 - e) Identify other consulting parties. In consultation with the SHPO, the CRM shall identify any other parties entitled to be consulting parties, including local government, Native American tribes, or applicants, and consider all written requests of individuals and organizations to determine which entities should be consulting parties.
2. Step 2: Identify Historic Properties
 - a) Determine scope of identification efforts. The CRM, in consultation with the SHPO (36 CFR 800.4), will determine and document the area of potential effects of the undertaking as defined in Sec. 800.16(d) and review the existing historic property inventory and relevant studies to determine whether or not historic properties are located within the proposed area(s) of effect. The CRM may also seek information from consulting parties, as appropriate. If the area of potential effects has not been surveyed, the CRM shall take steps necessary to ensure a reasonable and good faith effort to carry out appropriate efforts to identify resources. Professionals who meet the Secretary of Interior's Professional Qualifications Standards will perform all identification efforts. The CRM will direct all contact with the CHC conducted by internal and external personnel.
 - b) Evaluate historic significance. The NHPA acknowledges the possibility that a previously unidentified property that is eligible for the NRHP may be discovered in the area of potential effects. All properties identified in the area of potential effects will be evaluated for National Register eligibility applying the National Register criteria for evaluation (36 CFR Part 63) to properties identified within the area of potential effects that have not been previously evaluated for National Register eligibility. The evaluations of properties will be submitted to the CHC as SHPO for concurrence. Professionals who meet the Secretary of Interior's Professional Qualifications Standards will perform all evaluation efforts. Select option (1) or (2) below.

- (1) Historic properties affected. The CRM, in consultation with the SHPO, determines that historic properties are present in the area of potential effects and will be affected by undertaking and/or are located within the area of potential effects of the project. Go to Step 3.
 - (2) No historic properties affected. The CRM, with SHPO concurrence, determines that there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them. The CRM provides documentation of this finding, as set forth in 36 CFR 800.11(d), to the SHPO. The CRM also notifies all consulting parties of the decision and makes the documentation available to the public. Select one of the bulleted options below.
 - If the SHPO does not object within 30 days of receipt of an adequately documented finding, the SSFL's responsibilities under Section 106 are fulfilled and the action may proceed.
 - If the SHPO disagrees with the SSFL's determination and the SHPO considers that the proposed undertaking will have an "effect" on historic properties, go to Step 3.
3. Step 3: Assess Adverse Effects
- a) Apply criteria of adverse effect. The CRM, in consultation with the SHPO, any THPO, and interested parties who attach religious and cultural significance to identified historic properties, assesses the effect(s) of the proposed undertaking on historic properties following the criteria of adverse effect outlined in 36 CFR 800.5.
 - (1) Finding of no adverse effect. The CRM, in consultation with the SHPO [36 CFR 800.5(b)), determines that the proposed undertaking does not meet the criteria of adverse effect [36 CFR 800.5(a)(i)] and, therefore, will have no adverse effect on historic properties. A finding of no adverse effect also may result if the undertaking is modified or conditions are imposed, such as subsequent review of plans for rehabilitation by the SHPO, to ensure consistency with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68), to avoid adverse effects. The CRM documents the finding of no adverse effect following standards set forth in 36 CFR 800.11(e). The CRM notifies the SHPO and all consulting parties of the finding and provides them with the documentation. The SHPO must respond to the finding within 30 days. Select one of the bulleted options below.
 - Agreement with finding. If the Council is not involved in the review process, the action may proceed if the SHPO agrees with the finding. Failure of the SHPO to respond within 30 days from receipt of documentation shall be considered agreement of the SHPO with the finding. The undertaking may proceed if it is carried out in accordance with Sec. 800.5(d)(I). This section requires that the CRM maintain a record of the finding and provide information on the finding to the public on request, consistent with the confidentiality provisions of Sec.800.11(c). Implementation of the undertaking in accordance with the finding as documented fulfills the SSFL's responsibilities under Section 106.
 - Disagreement with finding. If the SHPO or any consulting party disagrees with SSFL's determination within the 30-day review period, it must respond in writing and must specify the reasons for disagreeing with the finding. The CRM can either consult with the consulting party to resolve disagreement or request Council to review the decision pursuant to paragraph 800.5(c).

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- (2) Finding of adverse effect. If it is determined that the proposed undertaking will have an adverse effect on historic properties, the CRM will consult further to resolve the adverse effect. Go to Step 4 a).
4. Step 4: Resolve Adverse Effects
- a) Continue consultation The CRM continues consultation with the SHPO and consulting parties to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize, or mitigate adverse effects on historic properties. The CRM submits documentation specified in 36 CFR 800.11(e) to the Council to notify them of the adverse effect finding. The SSFL can request the Council to participate in the consultation or the Council can decide to enter consultation proceedings based on criteria in 36 CFR 800, Appendix A. The Council has 15 days to notify the CRM and consulting parties whether it will participate in adverse effect resolution. In addition to the consulting parties identified in 36 CFR 800.3(f), other individuals and organizations can be invited to become consulting parties. The CRM makes information available to the public, including the documentation specified in 36 CFR 800.11(e) and provides an opportunity for comment about resolving the adverse effects of the proposed undertaking. Select option (1) or (2) below.
- (1) Resolve adverse effect—resolution without Council. The SSFL, the SHPO, and consulting parties agree on how the adverse effects will be resolved and execute an MOA. The CRM must submit a copy of the executed MOA, along with the documentation specified in 36 CFR 800.11(f), to the Council prior to approving the undertaking to meet the requirements of Section 106. Go to Step 5.
- (2) Resolve adverse effect—resolution with Council participation: If consultations between the SSFL and the SHPO fail to result in an MOA, the SSFL can request Council participation and provide the Council with documentation specified in 36 CFR 800.11(g). If the Council joins the consultation, the SSFL will proceed with consultations in accordance with 36 CFR 800.6(b)(2) to reach an MOA. If the Council decides not to join consultations, the Council will notify the SSFL and proceed to comment. Go to Step 5.
- b) Memorandum of Agreement: The Council receives the MOA for filing. The SSFL has discharged its compliance responsibilities under Section 106. The proposed undertaking can proceed, according to any MOA stipulations.
- c) Failure to resolve adverse effect—termination of consultation: The SSFL, SHPO, or the Council determine that further consultation will not be productive and terminates consultation by notifying all consulting parties in writing and specifying reasons for termination. Select 4c)(1), 4c)(2), or 4c)(3).
- (1) If the SSFL terminates consultation, the head of the agency or an Assistant Secretary or other officer with major department-wide or agency-wide responsibilities requests Council comment pursuant to 36 CFR 800.7(c) and notifies all consulting parties of the request.
- (2) If the SHPO terminates consultation, the SSFL and the Council may execute an MOA without the SHPO's involvement. The SSFL may then proceed with the undertaking according to any stipulations in the MOA.
- (3) If the Council terminates consultation, the Council notifies the SSFL, NASA's FPO, and all consulting parties of the termination and provides comments to the FPO under 36 CFR 800.7(c). The Council may consult with NASA's FPO prior to terminating consultation to seek to resolve issues concerning the undertaking and its effects on historic properties. Go to d) below.
- d) Comments by the Council: The Council has 45 days after receipt of request to provide comments. The Council will allow an opportunity for the SSFL,

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consulting parties, and general public to provide their views. The Council will provide its comments to the head of the agency with copies to the SSFL, FPO, and all consulting parties. Select d)(1) or d)(2) below.

- (1) The head of agency takes into account the Council comments and the SSFL implements the Council comments. Section 110(1) of NHPA requires that the head of the agency document this decision and may not delegate his or her responsibilities pursuant to section 106. See (3) below. The project may proceed.
- (2) The head of agency takes into account the Council comments and the SSFL does not implement the Council comments. The head of the agency shall document the final decision in accordance with 36 CFR 800.7(4). See (3) below. All consulting parties are notified of decision. The project may proceed.
- (3) Documenting the agency head's decision shall include:
 - Preparing a summary of the decision that contains the rationale for the decision and evidence of consideration of the Council's comments and providing it to the Council prior to approval of the undertaking.
 - Providing a copy of the summary to all consulting parties.
 - Notifying the public and making the record available for public inspection.

5. Proceed

- a) Once a signed MOA or Council comment has been received, the SSFL can, subject to the terms of any agreement that has been reached, proceed. This is the end of the Section 106 compliance process. All documentation and correspondence regarding the process will be kept on file in the CRM office.

5.6.10 SOP #10: Curation of Archaeological Materials

NASA is responsible for preservation of all archaeological collections and associated documents and photographs recovered on the SSFL. All archaeological materials recovered on the SSFL are curated at the Erskine Ramsay Archaeological Repository in the Moundville Archaeological Park, Moundville, California. SSFL collections are the result of contracted and in-house compliance activity and inadvertent discovery on the Center. This SOP outlines guidelines and instructions to be followed by private consulting firms for the preparation of archaeological materials and associated documents, maps and photographs before they are sent to the Erskine Ramsay Archaeological Repository for curation.

Applicable Laws/Regulations

- National Historic Preservation Act.
- Curation of Federally Owned and Administered Archeological Collections (36 CFR 79).

Policy

- All archaeological materials recovered from the SSFL will be curated in accordance with 36 CFR 79.
- All archaeological materials recovered from the SSFL will be curated in the Erskine Ramsay Archaeological Repository in the Moundville Archaeological Park, Moundville, California.
- All archaeological materials will be prepared in accordance with this SOP prior to being sent to the curation facility.
- All archaeological contracts that may result in materials to be curated will contain requirements and provide funds in the contract that the contractor will prepare all archaeological materials according to the procedures in this SOP and will pay for and send the archaeological materials to the Erskine Ramsay Archaeological Repository for curation.

Procedure

- I. All artifacts should be cleaned and stabilized prior to shipment to the repository, except in instances where an uncleaned condition may facilitate a particular form of analysis (e.g., Charcoal for C14). In such cases, appropriate documentation of the artifact's condition and the proposed analysis should be included in the artifact inventory and lab methods section of the final report.

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A. Cleaning:

1. For material collected on the SSFL, use a plain water rinse with a little soft brushing as necessary.
2. Pottery sherds should be treated with particular care during brushing to prevent any abrasion of the surface by the brush.
3. Sherds should not be cleaned at all if any soot-like material remains on the exterior or interior surfaces.
4. Metal artifacts should not be washed but merely dry brushed as needed.

B. Stabilization: Items requiring specialized conservation measures should be stabilized on a case-by-case basis and further documented in the artifact inventory and lab methods section of the report.

C. Sorting:

1. For Phase I Surveys, the collections are to be sorted by site number, project name, provenience, and number of artifacts.
2. If there are 100 or more artifacts such as in Phase II or Phase III testing, sort artifacts by artifact category (e.g., lithic, prehistoric ceramic, historic ceramic, metal, glass, other historic, ethnobotanical, or faunal).
3. All artifacts are put in 4-mil recloseable plastic bags.
4. All bags are to be labeled with permanent ink, with the site number, project name, provenience, a count of the artifacts, and the field specimen number. Metal artifacts, prehistoric pottery, and any faunal material will be separated into separate individual smaller bags and placed inside the larger artifact bag.
5. Place acid-free tags labeled with the same information in the bags.
6. Place bagged material that has been organized by site and provenience in cardboard artifact boxes.
7. Make a catalog of the content of each box. On a sheet of paper, list the field specimen numbers for each bag.
8. Number each box (see D below) and enclose a box catalog (packing list or inventory control document) in the box.
9. Store all field and lab documentation in acid-free file folders.
10. Label all photographic material with acid-free permanent ink and place in archival quality polypropylene sleeves.

11. Make a master box catalog that will list the project name, all artifacts recovered, their site number and provenience, and the contents of each bag in the box.

D. Boxes:

1. Site bags will be placed in numeric order in a standard, acid-free storage box (10-in high, 12.5-in wide, and 15-in long).
2. Box labels must be placed on the “width” end (below handle hole) of each sealed box.
 - a) Labels include the site numbers and/or other relevant additional information.
 - b) Labels should be typed or hand written in large font and bold letters for easy reading.
 - c) Box labels must be self-adhesive or securely attached to boxes with adhesive tape.
 - d) The minimum label size for the standard storage box is 3 × 5 in.
 - e) Multiple boxes for each site or project collection should be marked on the label with sequential box numbers (e.g., Box 1 of 4, Box 2 of 4, etc.). Such numbers must be applied to all boxes, containers, or other packaged artifacts, samples, documents, records, etc., and cross-referenced to packing lists or similar inventory control documents.

E. Special Packaging

1. Particularly delicate items, such as ethnobotanical and faunal samples, should be wrapped in aluminum foil and placed in a solid-side container such as a small acid-free box or plastic film canister before packaging with the rest of the site collection.
2. Oversized artifacts must be securely tagged with appropriate information on acid-free poster board. Mylar or Tyvek tags.
3. Soil samples should be completely dry before sealing in a 4-mil thick bag and packed separately from the site collection.

F. Shipping

1. To pack artifacts for shipping, place Styrofoam peanuts at the bottom of the box to act as a buffer and reduce excess volume. Do not use newspaper.
2. Place materials in position, then fill the remaining volume with Styrofoam peanuts to keep the materials in an upright or stable position within the exterior storage box. The weight of boxed collections should be distributed as evenly as possible.

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3. Standard acid-free storage boxes are suitable for shipping if the contents are appropriately packed.
 4. Ship the boxes to the Erskine Ramsay Archaeological Repository and pay the Repository in accordance with their current collection management services fees.
- II. The Erskine Ramsay Archaeological Repository will continue the curation process in accordance with 36 CFR 79.

6. Public Involvement Plan

Public consultation for Section 106 of the NHPA can be completed effectively by timely informing interested parties of potential impacts to historic properties. The SSFL will secure a list of interested persons, historic preservation groups, and other interested parties from the CA SHPO and Native American Heritage Commission. This list will consist of parties that have previously contacted their offices seeking information on or that have historic interest and/or cultural properties at the SSFL.

A proactive approach to all consultation is best. The SSFL will prepare letters to all of the identified interested parties asking if they want to be kept informed of any potentially adverse impacts to NRHP eligible properties. This process will allow the SSFL to keep a list of those parties that respond for time-sensitive coordination on significant projects. The SSFL will have to exercise best judgment on the need to coordinate every Section 106 action and may find it appropriate to begin involved public coordination only if the undertaking has the potential to be significant or controversial. The NEPA public involvement process will be used to allow for the combination of two authorities into a single set of review and comment periods. However, the NEPA documents, notifications, newspaper announcements, and any public meetings will specify that NRHP/Section 106 is part of the subject matter. Any public involvement or public notice will be coordinated with the SSFL Public Affairs Office.

Consultation on permits issued for ARPA relates to several areas of legal authority. The regulations for issuing permits requires coordination with Section 106 when the permit could impact properties eligible for, or listed on, the NRHP, and requires preparation of an appropriate NEPA document. While not explicitly stated, it is also appropriate to notify regionally recognized archeological groups regarding the permit's scope and purpose.

7. Preparer

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Appendix A. Santa Susana Field Laboratory Cultural Resource Management Plan Acronym List

ACHP	Advisory Council on Historic Preservation	MSFC	Marshall Space Flight Center
ADPA	Archeological Data Preservation Act	msl	mean sea level
AFB	Air Force Base	MTF	Mississippi Test Facility
AFP	Air Force Plant	NAA	North American Aviation
AHMS	Advanced Health Management System	NACA	National Advisory Committee for Aeronautics
AHPA	Archeological Historic Preservation Act	NAGPRA	Native American Graves Protection and Repatriation Act
AIRFA	American Indian Religious Freedom Act	NASA	National Aeronautics and Space Administration
APE	area of potential effect	NASM	National Air and Space Museum
ARPA	Archeological Resources Protection Act	NCSHPO	National Council of State Historic Preservation Offices
ASA	Archeological Survey Association	NEPA	National Environmental Policy Act of 1969, as amended
BP	before present	NHL	National Historic Landmark
BRM	bed rock mortar	NHPA	National Historic Preservation Act of 1966, as amended
CA SHPO	California State Historic Preservation Office	NPD	NASA Policy Directive
CEQ	Council on Environmental Quality	NPR	NASA Procedural Requirements
CFR	Code of Federal Regulations	NPS	National Park Service
CHC	California Historic Commission	NRHP	National Register of Historic Places
CHRIS	California Historical Resources Information System	NSTL	National Space Technology Laboratory
COCO	contractor owned, contractor operated	NWR	National Wildlife Refuge
CRM	Cultural Resource Manager, or Management	PA	Programmatic Agreement (per 36 CFR Part 800)
CRMP	Cultural Resources Management Plan	PFL	Propulsion Field Laboratory
CTL	Component Test Laboratory	PL	Public Law
DoD	Department of Defense	PM	Presidential Memorandum
DOE	Department of Energy	POC	point of contact
DPR	Depart of Parks and Recreation	RCRA	Resource Conservation and Recovery Act
EEMO	Environmental Engineering and Management Office	SCCIC	South Central Coastal Information Center
EEOH	Environmental Engineering and Occupational Health	SHPO	State Historic Preservation Office
EIS	environmental impact statement	SOP	standard operating procedure
EMB	Engineering Management Board	SSFL	Santa Susana Field Laboratory
EO	Executive Order	SSME	Space Shuttle Main Engine
ERD	Environmental Resource Document	THPO	Tribal Historic Preservation Office
FOIA	Freedom of Information Act	U.S.	United States
FPO	Federal Preservation Officer	USACE	US Army Corps of Engineers
GOCO	government owned, contractor operated	UCLA	University of California Los Angeles
HABS	Historic American Building Survey	USC	United States Code
HAER	Historic American Engineering Record	USGS	United State Geological Survey
HPO	Historic Preservation Office	UV	ultraviolet
IRBM	intermediate range ballistic missile		
LH2	liquid hydrogen		
LOX	liquid oxygen		
MOA	memorandum of agreement		

Appendix B. Santa Susana Field Laboratory Cultural Resource Management Plan Glossary

Advisory Council on Historic Preservation (ACHP): The Council was established by Title 11 of the NHPA to advise the President and Congress, to encourage private and public interest in historic preservation, and to comment on Federal agency action under Section 106 of the NHPA.

American Indian Religious Freedom Act (AIRFA): This act states that the policy of the U.S. is to protect and preserve for American Indians their inherent rights of freedom to believe, express, and exercise the traditional religions of the American Indian, Eskimo, Aleut, and Native Hawaiians. These rights include, but are not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremony and traditional rites.

Antiquities Act of 1906: This act provides for the protection of historic and prehistoric ruins and objects of antiquity on Federal lands and authorizes scientific investigation of antiquities on Federal lands, subject to permits and other regulatory requirements.

Archeological Artifact: An object, a component of an object, a fragment or sherd of an object that was made or used by humans, or a soil, botanical, or other sample of archeological interest.

Archeological Records: Notes, drawings, photographs, plans, computer databases, reports, and any other audio-visual records related to the archaeological investigation of a site.

Archeological Resource: Any material of human life or activities that is at least 100 years of age and is of archaeological interest (32 CFR Section 229.3(a)).

Archeological Resources Protection Act (ARPA) of 1979: This act prohibits the removal, sale, receipt, and interstate transportation of archaeological resources obtained illegally (without permits), from Federal or Indian lands and authorizes agency permit procedures for investigations of archeological resources on lands under the agency's control.

Area of Potential Effect (APE): The geographical area within which the undertaking may cause changes in the character of, or use of historic properties, if any such properties exist. The APE may change according to the regulation under which it is being applied. Code of Federal Regulations (CFR): Includes the Government-wide regulations that all Federal agencies must follow, and have the force of law.

Cultural Items: As defined by NAGPRA, human remains and associated funerary objects, unassociated funerary objects (at one time associated with human remains as part of a death rite or ceremony, but no longer in possession or control of the Federal agency or museum), sacred objects (ceremonial objects needed by traditional Native American religious leaders for practicing traditional Native American religions), or objects of cultural patrimony (having ongoing historical, traditional, or cultural importance central to a Native American tribe or group, rather than property owned by an individual Native American, and which, therefore, cannot be alienated, appropriated, or conveyed by any individual of the tribe or group).

Cultural Resources Management Plan (CRMP): A 5-year plan developed and implemented by an installation commander to provide for the management of cultural resources in a way that maximizes beneficial effects on such resources and minimizes adverse effects and impacts without impeding the mission of the installation and its tenants. CRMPs are required in accordance with AR 200-4.

Cultural Resources: Historic properties as defined by the NHPA, cultural items as defined by NAGPRA, archeological resources as defined by ARPA, sites and sacred objects to which access is afforded under AIRFA, and collections and associated records as defined in 36 CFR 79.

Curation of Federally Owned and Administered Archeological Collections (36CFR79): A ruling issued by the NPS that establishes definitions, standards, procedures, and guidelines to be followed by Federal agencies in the preservation and maintenance of collections of prehistoric and historic material remains and records in their care that are recovered from Federal or federally assisted programs.

Executive Order (EO) 11593 of 1971: This directs Federal agencies to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation; to ensure the preservation of cultural resources; to locate, inventory, and nominate to the National Register all properties under their control that meet the criteria for nomination; and to ensure that cultural resources are not inadvertently damaged, destroyed, or transferred before the completion of inventories and evaluation for the NRHP.

Executive Order (EO) 13007 of 1996 on Indian Sacred Sites: This provides additional direction to Federal agencies regarding Indian sacred sites. Federal agencies are, “within the constraints of their missions,” required to accommodate Indian tribes’ requirements for access to and ceremonial use of sacred sites on public lands and avoid damaging the physical integrity of such sites.

Executive Order (EO) 13287 Preserve America: This establishes a National policy for Federal Government leadership in preserving America’s heritage through active advancement of the protection, enhancement, and contemporary use of the historic properties owned by the Federal Government. This order also promotes intergovernmental cooperation and partnerships for the preservation and use of historic properties. Through specific steps and deadlines, the EO reemphasizes current requirements for assessment of the status of agency-controlled historic properties (under Section 110 of the NHPA) and management needs and suitability of these historic properties for contributing to community economic development initiatives, including heritage tourism.

Indian Tribe: Any tribe, band, nation, or other organized Indian group or community of Indians, including any Alaska Native village or corporation as defined in or established by the Alaska Native Claims Settlement Act (43 U.S.C. 1601 *et seq.*) that is recognized as eligible for special programs and services provided by the U.S. to Indians because of their status as Indians. Such acknowledged or “federally recognized” Indian tribes exist as unique political entities in a government-to-government relationship with the U.S. The Bureau of Indian Affairs maintains the listing of federally recognized Indian tribes.

Memorandum of Agreement (MOA): A formal written agreement containing the result of negotiations among the Federal agency, the CA SHPO, the ACHP, and interested public. The MOA documents mutual agreements upon statements of facts, intentions, procedures, and parameters for future actions and matters of coordination. It shows how the needs of the Federal agency, the needs and desires of the public, and the scientific/historical significance of the property have all been protected.

Memorandum for Heads of Executive Departments and Agencies Dated April 29, 1994: Government-to-Government Relations with Native American Tribal Governments: This directs that consultation between the Army and federally recognized Indian tribes shall occur on a government-to-government basis in accordance with this memorandum. Installation commanders shall treat designated representatives of federally recognized Indian tribal governments as the representatives of government. Consultation with federally recognized Indian tribes on a government-to-government basis occurs formally and directly between installation commanders and heads of federally recognized tribal governments. Installation and tribal staff-to-staff communications do not constitute government-to-government consultation.

National Environmental Policy Act of 1969 (NEPA): (P.L. 91-90; 42 U.S.C. 4321-4347) This Act requires Federal agencies to prepare an EIS for every major Federal action that affects the quality of the human environment. This includes both natural and cultural resources. It is implemented by regulations issued by the CEQ (40 CFR 1500-08), which are incorporated into AR 200-2, “Environmental Effects of Army Actions.” NEPA states that the policy of the Federal Government is to preserve important historic, cultural, and natural aspects of our national heritage and requires consideration of environmental concerns during project planning and execution.

National Historic Landmark (NHL): NHLs are buildings, historic districts, structures, sites, and objects that possess exceptional value in commemorating or illustrating the history of the U.S. They are so designated by the Secretary of the Interior after identification by NPS professionals and evaluation by the NPS Advisory Board, a committee of scholars, and other citizens.

National Historic Preservation Act (NHPA) of 1966: (as amended (P.L. 89-665; 16 U.S.C. 470-470w-6)), establishes historic preservation as a national policy and defines it as the protection, rehabilitation, restoration, and reconstruction of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, or engineering. Section 106 of the NHPA requires that Federal agencies take into consideration the effects of their actions on properties listed on or eligible for listing on the NRHP. It is

implemented by regulations (36 CFR 800) issued by the ACHP. Section 110 requires Federal agencies to locate, inventory, and nominate all properties on their lands that may qualify for the NRHP.

National Park Service (NPS): The bureau of the Department of the Interior to which the Secretary has delegated the authority and responsibility for administering the National Historic Preservation Program.

National Register Criteria: The criteria established by the Secretary of the Interior for use in evaluating the eligibility of properties for the NRHP (36 CFR Part 60).

National Register of Historic Places (NRHP): A nationwide listing of districts, sites, buildings, structures, and objects of National, state, or local significance in American history, architecture, archaeology, or culture that is maintained by the Secretary of the Interior. National Register listings must meet the eligibility criteria found in 36 CFR Section 60.4.

Native American Graves Protection and Repatriation Act (NAGPRA) of 1990: (P.L. 101-601), requires Federal agencies to establish Native procedures for identifying Native American groups associated with cultural items on Federal lands, to inventory human remains and associated funerary objects in Federal possession, and to return such items upon request to the affiliated groups. The law also requires that any discoveries of cultural items covered by the Act shall be reported to the head of the Federal entity who shall notify the appropriate Native American tribe or organization and cease activity in the area of the discovery for at least 30 days.

Paleontological Resources: Scientifically significant fossilized remains, specimens, deposits, and other such data from prehistoric, nonhuman life.

Predictive Model: Modeling used to determine areas of high-, medium-, and low-archeological potential.

Programmatic Agreement (PA): A formal agreement between agencies to modify and/or replace the Section 106 process for numerous undertakings in a program.

Section 106: Under the NHPA, Section 106 requires that Federal agencies take into consideration the effects of their actions on properties listed on or eligible for listing on the NRHP. It is implemented by regulations (36 CFR Part 800) issued by the ACHP.

Section 110: Under the NHPA, Section 110 outlines agencies' responsibilities with respect to historic properties and requires Federal agencies to locate, inventory, and nominate all properties that may qualify for the NRHP.

Section 111: Under the NHPA, Section 111 addresses, leases, and exchanges of historic properties. It allows the proceeds of any lease to be retained by the agency for use in defraying the costs of administration, maintenance, repair, and related expenses of historic properties.

Site Locational Models: A model, through past examples, used to predict locations of archeological sites.

State Historic Preservation Officer (SHPO): The person who has been designated in each state, in accordance with the NHPA (101(b)(1)A)), to administer the State Historic Preservation Program, including identifying and nominating eligible properties to the NRHP and otherwise administering applications for listing historic properties in the NRHP.

Survey: A scientific sampling of the extent and nature of archeological resources within a specific area.

Undertaking: Any project, activity, or program that can result in changes in the character or use of historic properties as defined by the NHPA. A project, activity, or program under the direct or indirect jurisdiction of the installation commander, including those projects, activities, or programs carried out or on behalf of the agency; those carried out with Federal financial assistance; those requiring a Federal permit, license, or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a Federal agency. Undertakings include new and continuing projects, activities, or programs and any of their elements not previously considered under Section 106 of the NHPA.

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Appendix C. Santa Susana Field Laboratory Historic Architectural Resources

Historic Structures at SSFL

The structures listed below are eligible for listing on the NRHP or are on the list as National Landmarks. Whenever work other than routine maintenance work is planned for any of these structures, contact the MSFC HPO, Ralph Allen (256) 544-4959) <ralph.h.allen@nasa.gov>.

= Test Stand
 NHL = National Historic Landmark
 NR = National Register
 NRE = National Register Eligible
 U = Utilized
 M = Mothballed
 AB = Abandoned
 C = Contributing to District—Not Individually Eligible

Santa Susana Field Laboratory - California									
Str #	Structure Name	Status				Survey Date			
		Historic				Jun 07	Jan 08		
NHL	NR	NRE	Other						
	Note: January 2008 survey not finalized. Data is pending and not for release.								
	Alfa Historic District								
208	Alfa Control House			X			X		
209	Afla Terminal House				C		X		
727	Alfa I Test Stand			X			X		
727A	Alfa I Electrical Control Station				C		X		
729	Alfa III Test Stand			X			X		
729A	Alfa III Electrical Control Station				C		X		
739	Standtalker Shack				C		X		
2X	Alfa Observation Structure (Pill Box)				C		X		
2Y	Alfa Observation Structure (Pill Box)				C		X		
	Alfa Landscape/Spillway				C		X		
	Bravo Historic District								
213	Bravo Control House			X			X		
214	Bravo Terminal House				C		X		
730	Bravo I Test Stand			X			X		
730A	Bravo I Electrical Control Station				C		X		
731	Bravo II Test Stand			X			X		
731A	Bravo II Electrical Control Station				C		X		
2Z	Bravo Observation Structure (Pill Box)				C		X		
	Bravo Landscape/Spillway				C		X		
	Coca Historic District								
218	Coca Control Center			X		X			
222	Coca Pretest Building				C		X		
235	Coca Electrical Control Station (LOX)				C		X		
236	Coca Electrical Control Station (LH ₂)				C		X		
237	Coca GH ₂ Compressor Building				C		X		
239	Coca GH ₂ Compressor Building				C		X		
241	Coca Pump House				C		X		
520	Coca High Pressure GH ₂ and GN ₂ Vault				C		X		
614	Coca IV Observation Structure (Pill Box)				C		X		
733	Coca I Test Stand			X		X			
787	Coca IV Test Stand			X			X		
2A	Coca North Observation Structure (Pill Box)				C		X		
2B	Coca Observation Structure (Pill Box)				C		X		
V99	Coca GH ₂ Vessel				C		X		
V100	Coca LH ₂ Vessel #1				C		X		
V189	Coca LOX Vessel #1				C		X		
	Coca Cable Tunnel				C		X		
	Coca Landscape/Spillway				C		X		

Appendix D. Curation of Federally Owned and Administered Archaeological Collections

National Park Service
U.S. Department of the Interior
National Center for Cultural Resources National
NAGPRA

36 CFR 79: Curation of Federally Owned and Administered Archaeological Collections

Authorities

Antiquities Act (16 U.S.C. 431- 433), the Reservoir Salvage Act (16 U.S.C. 469-469c), section 110 of the National Historic Preservation Act (16 U.S.C. 470h-2), and the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm).

What does 36 CFR 79 cover?

Responsibility for Federal collections; procedures and guidelines to manage and preserve collections; terms and conditions for Federal agencies to include in contracts, memoranda, agreements, or other written instruments with repositories for curatorial services; standards to determine when a repository has the capability to provide long-term curatorial services; and guidelines for collections access, loan, and use

What is a “collection?”

A collection is *material remains* that are excavated or removed during a survey, excavation, or other study of a prehistoric or historic resource, and associated records that are prepared or assembled in connection with the survey, excavation or other study. §79.4 provides detailed definitions of the kinds of material remains that fall under the regulation.

Who is responsible for ensuring that federally owned and administered collections receive proper care?

The Federal Agency Official is responsible for ensuring proper care of federally owned and administered collections. The Federal Agency Official is “any officer, employee, or agent officially representing the secretary of the department or the head of any other agency or instrumentality of the United States having primary management authority over a collection that is subject to this part.” (36 CFR 79.4 (c))

What constitutes proper care of federally owned and administered collections?

Repositories, whether they are Federal, state, local, or tribal, must be able to provide professional, systematic, and accountable curatorial services on a long-term basis. Among their responsibilities, repositories must perform the following:

- Provide a catalog list of the collection contents to the responsible party (i.e., Federal Agency Official, Indian landowner, or tribal official).
- Periodically inspect the physical plant to monitor physical security and environmental conditions.
- Periodically inspect the collection and associated records to monitor their condition.
- Periodically inventory the collection and associated records.
- Provide a written report of the results of inspections and inventories to the responsible party.
- Make the collection available for inspection by the responsible party.

Are there special requirements for archaeological collections from Indian lands?

Yes. Because Indian tribes are sovereign nations, archaeological collections from Indian lands are treated differently under 36 CFR 79. The Indian landowner or tribal official retains jurisdiction over the collections, including the right to determine access, use (including religious use), and disposition. Federal Agency and Repository Officials are encouraged to document their agreements with Indian landowners or tribal official regarding the care and use of archaeological collections from Indian lands.

What kinds of uses are encouraged for federally owned or administered collections?

36 CFR 79.10 addresses the scientific, educational, and religious use of such collections. Appropriate educational and scientific uses of collections include in-house and traveling exhibits, teaching, public interpretation, scientific analysis, and scholarly research. § 79.10 also describes the requirements that must be met when loaning a collection and provides guidance for allowing destructive analysis under certain circumstances.

Are there special requirements for the use of religious remains in collections?

Yes. Religious remains are “material remains that the Federal Agency Official has determined are of traditional religious or sacred importance to an Indian tribe or other group because of customary use in religious rituals or spiritual activities. The Federal Agency Official makes this determination in consultation with appropriate Indian tribes or other groups.” (36 CFR 79.4 (i)) Note that the definition of “religious remains” is broader than the NAGPRA definition of “sacred object.” Under § 79.10, religious remains in a collection must be made available to persons for use in religious rituals or spiritual activities. If the religious remains are from Indian lands, the Indian landowner or tribal official must give consent prior to such use. Under § 79.11, religious leaders, tribal officials, and official representatives of other groups for which the remains have religious or sacred importance have the right to periodically inspect the religious remains.

May a repository repatriate NAGPRA items that are part of a federally owned or administered collection?

No. The Repository Official must “redirect any request for transfer or repatriation of a federally owned collection (or any part thereof) to the Federal Agency Official, and redirect any request for transfer or repatriation of a federally administered collection (or any part thereof) to the Federal Agency Official and the owner.” (36 CFR 79.8 (n)) Further, “the Repository Official shall not transfer, repatriate, or discard a federally owned collection (or any part thereof) without the written permission of the Federal Agency Official, and not transfer, repatriate, or discard a federally administered collection (or any part thereof) without the written permission of the Federal Agency Official and the owner.” (36 CFR 79.8 (o))

Are NAGPRA cultural items excavated or removed from Federal or tribal lands after November 16, 1990 considered to be “collections” under 36 CFR 79?

No. However, Federal agencies should adhere to the standards of 36 CFR 79 in providing care for such cultural items prior to their disposition.

Where can I learn more about 36 CFR 79?

The complete text of the regulation is available online at <<http://www.cr.nps.gov/aad/tools/36cfr79.htm>>. Information about managing archeological collections, including the requirements of 36 CFR 79, is available online at <<http://www.cr.nps.gov/aad/collections/index.htm>>.

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